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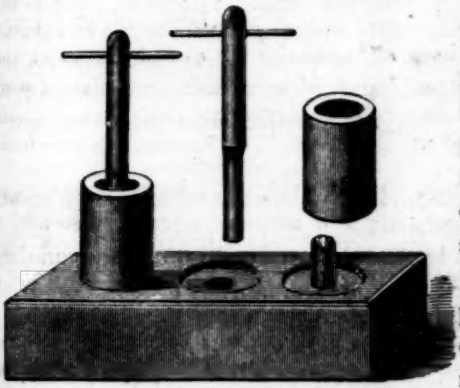
ON AN IMPROVED PILL PRESS.

BY JOSEPH P. REMINGTON.

Since the publication of the paper, by the writer, on the "Ready-made Pills of our day," in the Proceedings of the American Pharmaceutical Association for 1875, in which a pill press is described and figured, various improvements have been suggested, and have been introduced, which materially assist in facilitating the operation of compression. The accompanying sketch will illustrate:



The cut represents a double machine, and with it two or more sizes may be made, two and three grain pills on one, and four and five grain pills on the other, one base of cast steel answering for both.

By turning a conical depression in the top of the cylinder, a sort of funnel is made, which is a convenience in introducing the powder.

The countersunk depressions in the base, which take the cylinders, prevent them from slipping away in case a side blow is struck. Some of the machines have been made with the lower mould stationary, and no depressions for the cylinders to fit into; this form has some advantages, but is not believed to be as useful as that described above, for an unlucky side blow may break off the stationary lower mould, as it is made of hard steel, and this, of course, would be a fatal accident.

The middle depression in the base has an aperture which pierces it all the way through, and, after the blow is struck and the pill still

remains in the cylinder, the whole is transferred to this middle depression, when one blow drives the pill through.

In making a quantity of the pills, the base might rest on two upright posts, three or four inches high, and a box might be placed between the posts to receive the pills as they are finished.

The writer still adheres to the opinion expressed in the former paper alluded to, that compression should not be resorted to as a mode of making pills, when the powder used is *not readily soluble in the digestive fluids*, and hence the machine has but a limited use.

For acid or bisulphate of quinia pills, the machine answers very well, and as many as two hundred may be made in one hour, by having one operative to weigh the powder, and another to fill into the cylinder and strike the blow.

Like everything else of this kind, a little practice is necessary before success is assured in every instance; some difficulty is experienced in compressing the pills if the powder used be very dry, as in the case of effloresced sulphate of quinia, subnitrate of bismuth, &c., &c.

The effect of using a powder too dry is to cause the pill to split transversely, a minute quantity is apt to be blown out of the top of the cylinder when the blow is struck, and it is almost sure to clog the piston and render it necessary to clean it frequently, which is an annoyance, to say the least.

If the precaution is taken to slightly moisten, with water or other suitable liquid, such a powder (and the amount necessary to add to accomplish the result is soon learned), the difficulties usually vanish.

The pills may be set aside to dry by spontaneous evaporation of the moisture, or they can be dried artificially, by heated air, in much less time.

When the piston does adhere, from becoming clogged as above mentioned, it may be readily released by pouring a few drops of water into the aperture on to it, which will soften or dissolve the powder.

The machine may then be washed, and the cylinder dried quickly by passing through it a thick, soft piece of twine.

In conclusion, the writer takes this opportunity to state, in answer to correspondence and inquiries in relation to this contrivance, that no patent has been procured for it, no one has the exclusive right to manufacture, and any who care to, are at liberty to use it, have one made by their own mechanic, or buy of either of the makers in this city.

Philadelphia, Second mo. 8th, 1876.

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GLYCERIN DROPPER.

BY C. A. BOWMAN.

The arrangement for this purpose, noticed on page 89 of the February number of the "American Journal of Pharmacy" as an invention of my own, is only claimed as a slight improvement on the original idea of C. W. Wharton, of Nashville, Tennessee, a member of the firm of Wharton & Co., of that place.

The little apparatus consists of a small morphia or other wide-mouth bottle, having an aperture bored through the curved portion of the neck, at an acute angle with the outside edge, by means of a small, rat-tail file, after a notch has been made in the shoulder, by means of a sharp-edged file, sufficiently large for the round file to take hold, the operation being facilitated by the use of turpentine from time to time. Care should be taken to have the bent glass tube extend into the bottle, as shown in the figure, and fit tightly, as otherwise the contrivance will work imperfectly on account of escape of air from the bottle. This precaution taken, the bottle is filled with the fluid excipient, and a small finger stall drawn tightly over the mouth, which completes this simple but useful arrangement, making a convenient and proper medium for the adjustment of liquid excipients in making pill masses, and where it is necessary to get them of a proper consistency in order to turn out a good lot of pills. It is free from the inconvenience of the old mode of adjustment, and has besides the advantage of neatness, its size making it little in the way on the prescription counter. By very light pressure on the top of the rubber shield, the liquid is forced out through the glass tube in single drops, as shown in the figure, and a continuous stream can be obtained by continued and harder pressure. The flow ceases instantly on removing the finger, and air enters through the tube equal to the bulk of liquid removed.

CACHETS DE PAIN.

BY HARRY P. LECHLER, PH. G.

For some time past, the attention of physicians and pharmacists has been directed to the wafer discs found in the market under the name of "Cachets de Pain," as a method by which the most nauseous medicines may be administered in a pleasant form. Quinia, aloes, bromide of potassium and many other remedies are often very objectionable to the patient, on account of the disagreeable taste they possess, and to cover this without impairing their therapeutical value has long been a source of trouble and anxiety to the physician. This, the inventor of "Cachets de Pain" claims to have accomplished. By his theory, the patient has neither taste nor smell of any medicine prescribed, whether unpleasant to the palate or injurious to the teeth, and the medicinal properties of the compound are not in the least impaired by the enclosure.

To prepare the "Cachet" for administration, the compound prescribed is first placed in one of the concave discs, the internal surface of the rim is then moistened with water, another wafer disc is moistened in a similar manner and placed carefully over the first, the margins are then made to adhere by means of a small lever press. The medicated "Cachet" is now ready for the patient, who, by first dipping in cold water, placing upon the tongue, and with a draught of water, is enabled to swallow with ease. Thus, in theory, the "Cachets de Pain" are all that could be desired, but the question arises, How will this theory hold in practice?

In the first place, the time required to prepare twelve "Cachets" is, at the least calculation, five times longer than that required to dispense an equal number of pills or powders, and often, when the discs are moistened and pressed, we find them adhering to the press; this may be the result of an excess of moisture, or of more pressure than is actually required; but they are then to be removed with care, otherwise they will break where the line of moisture extends, thus entailing the necessity of preparing another; and after removing from the press the "Cachets" require careful drying, otherwise when placed in a box they will adhere to each other. You make answer, They were not properly prepared. Manipulate with all the skill at your command, you will often have an excess of moisture; and this, combined with the pressure exerted upon the thin coating, has a tendency to cause a rupture.

Then, in the administration of medicines in this form, we are met with a very serious objection. When the physician, not being aware that it is necessary (according to the theory) to dip the "Cachet" in cold water before placing upon the tongue, fails to convey this fact to the patient, and often, by want of thought, when in possession of this fact, does not give directions how to administer, or, of proper management on the part of the patient, it is found that, instead of disguising the compound within, the "Cachet" materially assists in the development of the unpleasantness the physician endeavors to conceal; for, when administered, the patient discovers that in place of descending the œsophagus, as expected, it has adhered to the roof of the mouth, and in his efforts to detach it therefrom, invariably succeeds in breaking the thin coating, and then enjoys the felicity of that delectable experience he would avoid. This is not only my personal experience, but that of several physicians of this city, who, having submitted this method to a fair trial, have arrived at the conclusion that "Cachets de Pain" are a failure.

Then, again, is it reasonable to suppose for an instant that two soluble salts would retain their separate and distinct characteristics when in contact with waters?

And yet the inventor of "Cachets de Pain" states that they allow the presentation of two separate and distinct salts in one envelope, which, when dissolved in the stomach, will unite and form a salt in the nascent state. For the benefit of those who favor this theory, I state the result of two experiments.

The first "Cachet" was prepared with carbonate of potassium and powdered citric acid, in a perfectly dry state; upon dipping for an instant in water, an effervescence ensued. The other was prepared in precisely the same manner, with tartaric acid and bicarbonate of sodium. The result of this experiment was a violent elimination of carbonic acid, with force sufficient to rupture the coating. If this be the result of simply dipping in water for an instant, how can the salts unite to form one in the nascent state in the stomach? It is impossible, simply because they have united before entering the stomach.

With the jujube paste capsules of M. Planten, this can be accomplished, for the reason that they require some time to dissolve before the liquid comes in contact with the contents.

These capsules are recommended by physicians for the administra-

tion of concentrated or nauseous medicinal substances, as being far superior to any method ever invented.

It is to be hoped the day is not far distant when "Cachets de Pain" will be referred to only as a thing of the past, which, through want of merit and practicability, fell into disuse.

NOTE BY THE EDITOR.—We can scarcely regard excessive moistening of the rim of the discs, or the omission of moistening the wafer capsules before swallowing, as sufficient arguments against the use of the *cachets de pain;* just as little as the excessive addition of an excipient or the mastication of pills by some patients can be advanced as arguments against the administration of medicines in the form of general pills. Regarding the premature effervescence which is apt to take place, if a mixture of an acid and a carbonate is enclosed in the same wafer capsule, this may be obviated by keeping the two articles separate in two distinct cells, by inserting between them a flat wafer disc, which will prevent their coming in contact until the wafer has been completely disintegrated in the stomach.

TINCTURA CAPSICI.

BY GEORGE W. KENNEDY, PH. G.

Within the last few years many changes have been recommended in the manufacture of the various pharmaceutical preparations of the pharmacopœia, some writers recommending a change in the menstruum, others a change in the quantity of solid material to be used, while others advocate a more expeditious mode of preparation. Of the first I might allude to the Tincture of Rhubarb, for which glycerin has been highly commended as an excellent solvent, and it seems to me that it would make a very desirable addition, as a more permanent preparation can be obtained,—the glycerin preventing to a great extent the precipitation of the chrysophanic acid, the cathartic principle of the drug. On the second point, as to the quantity of solid material to be used, much has been written in favor of making each pint of fluid extract represent eight troy ounces of the drugs instead of sixteen, as at present directed. On the third point, recommending a quicker method of making certain preparations, I simply desire to mention a few without discussing the advantages or disadvantages, which is not my object at this time. In the preparation of tinct. opii camph. it has

been recommended to use spiritus camphoræ and tinct. opii in such quantities as to equal the powdered opium and camphor, as directed by the pharmacopœia; and it has also been proposed to make some tinctures, syrups and infusions from fluid extracts. Some of the changes recommended are good, and it might be well for the various committees on the preliminary revision of the pharmacopœia to pay attention to this matter and experiment with the new formulas recommended, and, if they prove better than those now in use, to advise a change, otherwise let them pass by.

Up to the present time, the writer has not noticed in any of the pharmaceutical journals a recommendation to change the menstruum used in the making of tincture of capsicum. The present menstruum is not only pharmaceutically objectionable, but is more especially so in a medicinal point of view. The object that every pharmacist has, or should have, in view, is to put forth preparations that fully represent the active constituents of the drug. To arrive at a definite conclusion as to what should be the best menstruum and best process of preparation, requires a large amount of labor and experimenting, and involves also a loss pecuniarily.

My object here is to advise a change in the menstruum, used in making tincture of capsicum, from diluted alcohol to alcohol. I have two reasons for doing so: 1st, that diluted alcohol does not thoroughly exhaust the drug,—the authenticity of which can be proven by treating the dregs left after making the tincture, as now prescribed by the pharmacopæia, with alcohol, which will dissolve the hot and stimulating principle of the drug quite perceptibly; 2d, that the preparation, when made of diluted alcohol, as now directed, is rather unsightly, and does not present that elegant appearance as when made with alcohol; and in these days of pharmaceutical elegance, it is requisite to make handsome pharmaceutical preparations, so long as it can be done without sacrificing the medicinal qualities of the drug. It is just as necessary to make tincture of capsicum with alcohol as tincture of ginger. I doubt whether there is a pharmacist to be found that would think of using diluted alcohol for the latter; and since the active constituents of both ginger and capsicum are oleo-resins, and, as they are insoluble in water, we should object to the menstruum of the pharmacopœia for tincture of capsicum, and should use only alcohol, which dissolves the oleo-resin quite freely. I would therefore submit the

following for obtaining a more permanent tincture, and one which fully represents the active constituents of the drug:

Take of capsicum, in fine powder, one troy ounce; alcohol a sufficient quantity, moisten the powder with alcohol, pack firmly in a cylindrical percolator, and gradually pour alcohol upon it until 2 pints of tincture are obtained.

Pottsville, Pa., January 20, 1876.

NOTE BY THE EDITOR.—The German Pharmacopœia directs to prepare tinctura capsici by macerating for eight days one part of finely cut capsicum with ten parts of alcohol spec. grav. 0·830 to 0·834.

BISMUTH AND IRON.

BY R. ROTHER.

The normal bismuthous salts are very definite chemicals, and most of them can be quite easily prepared. There are, though, a number of bismuthous oxysalts, which in general present great difficulty of preparation, owing to the variable nature of their composition. As several of these basic compounds are used in medicine, a certain regularity is aimed at in their constitution. But none of the various methods in use always yield exactly the same product by the same course of procedure.

Of the normal salts, the citrate has been the most troublesome to produce in a desirable shape and of constant composition. The writer believes to have made the first advance towards a satisfactory method of preparing it. The process was published in the *Pharmacist* for September, 1872, and consisted in crystallizing the citrate from a moderately dilute and not too strongly acidulated solution of the ammonio-citrate. Since then, the writer has adopted an entirely new method, which, for simplicity, rapidity and precision, ranks the process as absolutely perfect. The astonishing simplicity is so remarkable that one is surprised the process was not discovered long before this, since it is nature almost directly synthetic.

If the ordinary bismuthous oxynitrate is heated for a few moments with a concentrated solution of an equivalent of citric acid, the normal citrate is generated as a heavy crystalline powder, and the nitric acid entirely freed and easily washed away by decantation. 10 parts of bismuthous oxynitrate, 7 parts of crystallized citric acid, and 30 to 40 parts of water are heated together for a few minutes, until a drop of

the mixture forms a clear solution with ammonia water, the crystalline mass is then diluted with 8 to 10 times its volume of water, set away for a short time to let the citrate subside, and the clear liquid then decanted. The crystalline sediment is now washed 3 or 4 times in a similar manner, drained from superfluous water, and either dried on a water-bath or by exposure in the open air. The yield is about 13 2-3 parts, showing that the salt is anhydrous, and therefore its formula is $Bi'''C_6H_5O_7$.

The bismuthous citrate, as such, is not much prescribed, but it is undoubtedly superior to either the oxynitrate or oxycarbonate, both of which are medicinally much employed. The ammonio-citrate is considerably used, and as no method thus far proposed for this salt has been particularly applicable, the writer's new process for preparing the citrate in a perfectly pure and definite state will make it possible of producing an ammonio-citrate with great ease and dispatch, and also of perfect purity.

Dry bismuthous citrate, treated with the ordinary ammonia water, dissolves to a syrupy liquid, but a part agglutinates to a hard white mass, unaffected by excess of ammonia; if gentle heat is applied this dissolves, and on cooling, the whole forms a crystalline mass, soluble in water. These crystals, dried over a water-bath, are again soluble in water. The yield from 8 parts of the citrate is nearly 10 parts. This product shows that there are several modifications of the ammonio-citrate, which may differ in chemical constitution as well as in physical properties.

The chemical composition of the ammonio-citrate has not been correctly given. The writer found that the same quantity of ammonia was required to form a neutral ammonio-citrate, as was separately required to form normal triammonium citrate, with the equivalent of citric acid in combination as bismuth salt, and the decomposition may be written thus: $BiC_6H_5O_7+3(NH_4OH)=(NH_4)_3C_6H_5O_7Bi(OH)_3$. The compound represented by the second number is assumed to be a combination of normal triammonium citrate with normal bismuthous hydrate, and this compound must therefore be looked upon as the true ammonio-bismuthous citrate, as all other formulæ are based upon an analysis of the scaled salt, which must of necessity be an indefinite substance.

The writer has also found that normal ferric citrate when treated with ammonia, absorbs an amount corresponding as normal triammo-

nium citrate, with the equivalent of citric acid contained in the iron citrate, and hence the true or normal ammonio-feroxycitrate is also produced as follows:

$Fe'''C_6H_5O_7+3(NH_4OH)=(NH_4)_3C_6H_5O_7.Fe(OH)_3$, that is triammonium citrate combined with normal ferric hydrate. It is, therefore, the iron analogue of ammonio-bismuthous citrate.

The writer has also ascertained that besides the normal green ammonio-ferric citrate, two other ammonio-ferric citrates exist, corresponding to the di and mon-ammonium citrates. The formulæ for the 3 green double salts are, for triammonio-ferric citrate $Fe'''(NH_4)_32(C_6H_5O_7)$, for diammonio-ferric citrate $Fe'''(NH_4)_2C_6H_5O_7.C_6H_6O_7$ or $Fe'''(NH_4)_2H2(C_6H_5O_7)$, and for monammonio-ferric citrate $Fe'''(NH_4)2(C_6H_6O_7)$ or $F'''(NH_4)H_22(C_6H_5O_7)$. The first one only is neutral, the other two are acid salts. If either of these salts is treated with ammonia in excess, the solution becomes brown, and in some cases, as for instance with the potassium double citrates, which do not hold the iron as firmly as the corresponding ammonium salts, ferric hydrate is precipitated. The reaction, therefore, indicates that a monado-fer-oxy-citrate was produced. It is, however, remarkable that the addition of citric acid or an acid monad citrate does not immediately restore the green color, but in some instances proceeds very slowly, the transition from brown to green is not simultaneous throughout the solution, but progresses from the bottom upwards, even if the solution is occasionally shaken, it resumes this order of progressive action.

The most surprising relationship, is however, evinced when ammonio-bismuthous citrate and triammonio-ferric citrate are brought together, and the change of color is the same as when triammonium citrate is added to the iron salt. The light green solution is further remarkable for the very important fact that moderate or strong acidulation with citric or nitric acid fails to separate the bismuthous citrate. This property, therefore, renders it possible of holding bismuthous citrate in acidulated solution, providing ammonio-ferric citrate is also present.

The same amount of citric acid in combination as ammonio-bismuthous citrate, is required to change an equal equivalent of the acid combined as ferric citrate into the green ammonio-ferric citrate, as would be required in the condition of triammonium citrate. Therefore the result is expressed as follows:

$Fe'''C_6H_5O_7+(NH_4)_3C_6H_5O_7.Bi(OH)_3=Fe'''(NH_4)_32(C_6H_5O_7).Bi(OH)_3$.

That is, one equivalent of triammonio-ferric citrate combined

with one equivalent of normal bismuthous hydrate. This is a most peculiar compound, and possibly indicates that the normal bismuthous hydrate ($Bi(OH)_3$) differs in its affinities from the basic or oxyhydrate ($Bi(OH)O$) as the normal salts differ from the oxysalts. The compound treated with ammonia in excess becomes brown, but addition of citric acid again restores the green color, however, similar as in case of the ammonio-ferric citrate alone, but slowly.

The new compound will doubtless become of pharmacal value, since the property of retaining the bismuth in an acidulated solution must strongly recommend it.

NOTE ON CITRATE OF IRON AND QUINIA.

BY J. U. LLOYD.

"Triturate the sulphate of quinia with six fluidounces of distilled water, and, having added sufficient diluted sulphuric acid to dissolve it, cautiously pour into the solution water of ammonia, with constant stirring, until in slight excess. Wash the precipitated quinia on a filter, and, having added it to the solution of citrate of iron, maintained at the temperature of 120° by means of a water-bath, stir constantly until it is dissolved."—*U. S. P.*

My experience is that the process is objectionable in consequence of too great a temperatue being employed. Precipitated quinia melts when added to a solution of the above temperature, and forms a gummy, sticky mass, which adheres tenaciously to the stirring spatula and sides of the containing vessel.

When in this form, quinia dissolves very slowly in the solution of citrate of iron.

To obviate this difficulty, reduce the solution of sulphate of quinia to the temperature of 50° before precipitating with ammonia. Wash the precipitate quickly with water of the same temperature. The result will be a light, friable, porous mass, which, when added to the solution of citrate of iron, *also at the temperature of* 50°, will break into small particles when stirred, and quickly dissolve.

When precipitating quinia for other purposes, if cold water is used, the process will be facilitated, for the precipitate can be easily washed without forming a mass and sticking to the filter.

Cincinnati, Ohio.

AN EXPERIMENT ON ANTISEPTICS.

BY M. S. BIDWELL.

November 15th, 1875, a number of wide mouth 8 oz. bottles were prepared, each containing 4 ozs. of water and ½ oz. raw, lean beef. One of these was left without any addition, 20 of them were arranged in sets of four, and to each bottle was added 1, 2, 3 and 4 grs., respectively, of each of the antiseptics under trial, which were carbolic acid (or phenol), salicylic acid, chloral hydrate and benzoic acid. Four sets of bottles were thus occupied. The recent statement, that the alkaline salicylates have no antiseptic power, coupled with the well-known fact, that putrefaction is usually accompanied by an alkaline reaction, suggested the fifth series, containing the same quantities of salicylic acid as in the other series, with the addition of half a drachm of dilute hydrochloric acid to each bottle. Finally, to the twenty-second bottle was added the same amount of hydrochloric acid alone, for comparison. The whole were loosely covered to exclude dust, and set away at the usual temperature of the store, varying from perhaps 55° to 70°. From pressure of business, but little attention was paid to them, and no record was kept of their progressive changes; but, seven weeks later (Jan. 3d, 1876), they were all examined. The following were found more or less putrid, with an offensive ammoniacal odor, much like that of stale urine, viz: The phenol, 1, 2 and 3 grs., salicylic acid the same, benzoic acid 1 gr. and all those containing chloral. In the three containing salicylic acid, the liquid was covered with a thick coating of mould, which was not the case with any of the others, illustrating the fact, which had been previously noticed, that a very small amount of this acid not only does not prevent, but even seems to favor the growth of mould. The bottle containing no antiseptic was, of course, quite offensive, but was not mouldy. The following were free from odor, and apparently unchanged, viz: All that contained salicylic and hydrochloric acids combined, the 2, 3 and 4 grain benzoic acid, the 4 grain phenol, which still preserved, as at first, its slightly carbolic or tarry smell. In all these the water remained clear, or nearly so, the meat having a whitish color and a soaked look. In the sample to which hydrochloric acid alone had been added, the water was clear and inodorous, but had a white, translucent substance, something like coagulated albumen, floating in it. No microscopic examination was made.

From the results of this experiment may be fairly deduced the fol-

lowing conclusions, subject, of course, to correction by further observations:

1. Of the four antiseptics mentioned, benzoic acid is effective in the smallest quantity, phenol and salicylic acids coming next, and being about equal, while chloralhydrate, at least in the ratio of one part in 500, has little or no permanent value.

2. Salicylic and hydrochloric acids combined are more effective than either of the four mentioned. How much of this effect may be due to each, and how much to the combination, could only be determined by further trial, as also how small a quantity of hydrochloric acid would be required. In this experiment, it will be noticed that this was used in about four times the largest quantity of the other agents, as it was not expected to act as an antiseptic, but only to aid the salicylic acid, preventing its extinction by the alkaline products of putrefaction. Yet, if so small a proportion (less than 1 per cent.) of this acid could so effectively retard decomposition, the fact might sometimes be used with advantage, as it would in many cases be convenient and unobjectionable.

One such experiment, of course, settles nothing; but these results are given for what they are worth, with the hope that others may extend and verify or correct them. The effect of the hydrochloric acid in this case was certainly unexpected by the experimenter, and would seem to suggest further investigation. It will be noticed that the failure of the chloral in this experiment does not at all conflict with the results reported by T. Roberts Baker to the American Pharmaceutical Association at the last meeting, as the weakest solution that he found efficient was 5 grs. to the fluidounce, or 25 times the strength of any used in this case, while he found that a 2 gr. solution only retarded decomposition without permanently preventing it.

Elmira, N. Y., Feb., 1876.

THE BASICITY OF THE PHOSPHORUS ACIDS.

BY R. ROTHER.

Phosphorus, sulphur, arsenic and antimony are possessed of certain common characteristics which indicate a very close relationship between them, and, although various anomalies spring from each particular member of the series, it is nevertheless plain that they virtually effect the transition from metals to metalloids, and from metalloids to the

limitless sphere of the nitrogen and carbon compounds. Phosphorus joins hands, as it were, with the organic and protorganic worlds, constituting a sort of connecting link, forming them into a continuous series.

The acids of phosphorus mark the transition from the mineral to the carbon acids. Their basicity, for this reason, is peculiar, showing the properties of both, and being entirely like neither. Organic or carbon acids are compounds of oxygenated hydrocarbon radicals with hydroxyl. The phosphorus acids are, to a certain extent, analogous to these, hence they may be described as compounds of oxygenated hydrophosphorus radicals with hydroxyl. The definition, however, is not capable of general application, by virtue of the fact that the combined hydrogen is wholly and completely typic in one member of the group, namely, metaphosphoric acid. This acid, however, is the link adjacent to the mineral acids, in which proximity the hydrogen has become wholly typic, and hence the definition is not appropriately applicable in this case.

Assuming that the acids of phosphorus are formed from trihydric phosphide (PH_3) by the interpolation of oxygen, and we have:

Hypophosphorous acid, $PO_2H_3=PO_2H_2,H=POH_2(OH)$.
Phosphorous acid, $PO_3H_3=PO_3H,H_2=POH(OH)_2$.
Orthophosphoric acid, $PO_4H_3=PO_4,H_3=PO(OH)_3$.

But comprehending all the acids, and we have, more fully, thus:

Hypophosphorous acid, $P_2O_4H_6=P_2O_4H_4,H_2=(PO)_2H_4(OH)_2$.
Phosphorous acid, $P_2O_6H_6=P_2O_6H_2,H_4=(PO)_2H_2(OH)_4$.
Orthophosphoric acid, $P_2O_8H_6=P_2O_8,H_6=(P_2O_4)H_2(OH)_4$.
Pyrophosphoric acid, $P_2O_7H_4=P_2O_7,H_4=(P_2O_4)H(OH)_3$.
Metaphosphoric acid, $P_2O_6H_2=P_2O_6,H_2=(P_2O_4)(OH)_2$.

This arrangement reveals a number of very important facts. It shows the regular gradation and development of the series in a most lucid and comprehensive manner, and the gradual evolution from the hydrophosphorus, PH_3, becomes evident in every member. The relation to the carbon acids is most apparent in the two lowest derivatives, in which the accumulation of oxygen has not entirely overcome the direct contact of phosphorus and hydrogen. In the hypophosphorous acid, only one-third of the combined hydrogen is typic, and in the phosphorous acid two-thirds. The evolution of phosphorus hydrides from either of these two acids by means of heat shows that the whole

of their hydrogen is not replaceable, and that only that portion is typic which is liberated, by means of heat, in combination with oxygen. In the orthophosphoric acid, the accretion of oxygen has so far progressed that the direct contact between phosphorus and hydrogen is no longer maintained, since the balance of affinity now leans strongly towards the oxygen. Heat now expels hydrogen only in combination with oxygen, but no amount of heat can expel more than two-thirds of all the hydrogen combined. The remaining third, constituting the typic hydrogen of metaphosphoric acid is absolutely beyond the direct influence of phosphorus, and the powerful affinity of phosphorus for oxygen, on the one side, and oxygen for hydrogen on the other, retains the compactness of the union beyond the ordinary effects of molecular vibration.

By this arrangement we also discover the appalling inconsistency of the new notation in its treatment of the phosphoric acids. The misconception of the tetrabasicity of pyrophosphoric acid, and the erroneous theory of the trivalent radical phosphoryl, $(PO)'''$, together with the entire new notation of the phosphoric acids, are thereby wholly refuted. Trivalent phosphoryl is utterly inapplicable in case of pyrophosphoric and metaphosphoric acids, as no satisfactory expression can be obtained by its use. It is also plain that a trivalent radical cannot be common to a monobasic, a tribasic and a tetrabasic acid. Furthermore, the inconsistency of the notation must refute itself which represents the three acids thus:

Metaphosphoric acid, $PO_3H=PO_2(OH)$.
Orthophosphoric acid, $PO_4H_3=PO(OH)_3$.
Pyrophosphoric acid, $P_2O_7H_4=P_2O_3(OH)_4$.

Which indicates that there are as many independent radicals as acids, and that while $(PO_2)'$ is univalent, $(PO)'''$ is trivalent and $(P_2O_3)^{iv}$ quadrivalent. There is neither sense or reason in such an assumption in view of the fact that the three acids differ from one another by two equivalents of hydroxyl less for every equivalent of oxygen in excess of the radical, P_2O_2, as is shown by the following:

Metaphosphoric acid, $P_2O_4(OH)_2=P_2O_2(OH)_2O_2$.
Pyrophosphoric acid, $P_2O_3(OH)_4=P_2O_2(OH)_4O$.
Orthophosphoric acid, $P_2O_2(OH)_6=P_2O_2(OH)_6$.

According to the new notation of the phosphoric acids, metaphosphoric acid, (PO_3H), is first, orthophosphoric acid, (PO_4H_3), second,

and pyrophosphoric acid, ($P_2O_7H_4$), third in the series. But, as the first and second members differ by one equivalent of hydroxyl, (OH), the second and third would vary by the same difference, and hence pyrophosphoric acid under this law should be written PO_5H_4. This does not, however, agree with facts, as was exhibited by the comparison just preceding.

By the new arrangement as above proposed, which in reality is the natural and true system of notation for the phosphorus acids, being in perfect consonance with the typal theory, all the phosphoric acids contain the bivalent radical phosphoryl, $(P_2O_4)''$, in two cases in combination with partially affected or typoid hydrogen and hydroxyl, and in one wholly in union with hydroxyl. The affected or typoid hydrogen, being yet distantly influenced by the phosphorus of the radical, does not assume the function of hydroxyl, and therefore, particularly in the case of orthophosphoric acid, it ordinarily possesses no salifying power; consequently this affected hydrogen does not virtually represent basisity. It is, however, replaceable by bases, under extraordinary conditions; but in such instances the highly basic character of the compound barely admits of classification as a true salt.

Ignoring the indifferent hydrogen, it will then be seen that metaphosphoric acid is dibasic, pyrophosphoric acid tribasic and orthophosphoric acid tetrabasic. But, admitting the full value of the hydrogen, then metaphosphoric acid remains dibasic, pyrophosphoric acid becomes tetrabasic, and orthophosphoric hexabasic.

For convenience sake, they may be represented as monobasic, dibasic and tribasic. It is, however, atomically correct that they be designated as bibasic, tetrabasic and hexabasic, in which case the tetrabasisity of pyrophosphoric acid, as at present held, would be correct, but in every other instance it would be, typically considered, utterly wrong.

But absolute typic value is the perfect index of basicity, therefore typoid hydrogen is not admissible in a determination of that quality, and as various indications point favorably that way, it appears that the correct basic value of the phosphoric acids is shown by the new arrangement, in which they are respectively dibasic, tribasic and tetrabasic, regardless of typoid hydrogen.

Although fused sodium pyrophosphate is correctly represented by $Na_4(P_2O_7)$, it appears highly probable that the aqueous solution contains it as $Na_3H(P_2O_7)(NaOH.)$ This expression, in a measure, ex-

plains the fact why the sodio-ferric pyrophosphate precipitated by alcohol should yield only $2(Na_4P_2O_7)(Fe_43(P_2O_7)$, instead of $3(Na_4P_2O_7)(Fe_43(P_2O_7))$, as which it exists in solution. For if we represent the sodium salt in solution by $3(Na_3H(P_2O_7)NaOH)$ the first effect of the alcohol will be a tearing away of the exposed alkali; the immediate result of this is the formation of a corresponding amount of acid salt, which also dissolves, while in the mean time the remnant precipitates in the anhydrous condition. The decomposition is clearly illustrated by the following:

$3(Na_5P_2O_7)+3(OH_2=3(Na_3H(P_2O_7)NaOH)$.
$Na_9H_3(P_2O_7)_3(NaOH)_3=2(Na_4P_2O_7)+NaH_4(P_2O_7)+3(NaOH)$.
$NaH_3(P_2O_7)+3(NaOH)=Na_4P_2O_7+3(OH_2)$, or,
$Na_3H(P_2O_7)(NaOH)+2(OH_2)$.

AMMONIUM IN DILUTED PHOSPHORIC ACID.

BY HENRY TRIMBLE.

(*Read at the Pharmaceutical Meeting, February* 15)

The process, recently offered by Prof. Markoe, for making diluted phosphoric acid, has been a fruitful source of controversy among pharmacists during the past few months, and many objections have been advanced, and advantages claimed, with the addition of but few facts to sustain them.

I have endeavored, under the direction of Prof. Maisch, to fully investigate one of these objections, namely, that in reference to the amount of ammonium generated during the process.

Two lots of the acid were prepared, one in the proportion of 12 ounces of nitric acid, 4 cubic centimetres of bromine and 2 ounces of phosphorus. The bromine was dissolved in the nitric acid and the phosphorus afterward added. The reaction commenced at 65° F., and was allowed to continue until the temperature reached 95°, when the flask was placed in water of 60°, where it remained for 24 hours. The phosphorus not then being entirely dissolved, heat was applied and very gradually increased until it reached 140°, at which degree it was maintained for 2 hours before the solution was completed. The usual process was then employed of heating in a capsule until free from nitric acid, and diluting with water to bring it to the officinal strength. In the second experiment, the same proportions were adopted with the addition of 12 ounces of water. Little or no reaction occurred, unless

the temperature was maintained at from 100° to 130°, and the mixture was finally boiled to dissolve the last portions of phosphorus.

A third sample was obtained from Dr. Pile, who employed no heat in the process, but on the contrary, kept the mixture in cool water until complete solution of the phosphorus was effected. A fourth sample was procured from a fellow-student, C. S. Hallberg, who placed the mixture in cool water for 24 hours, during which time about two-thirds of the phosphorus was dissolved, and then resorted to boiling for completing the solution.

Owing to the impossibility of estimating phosphoric acid by direct saturation, on account of the very gradual change from an acid to an alkaline condition, a seemingly intricate, but practically very simple process was adopted. Half a fluidounce of the diluted acid was supersaturated with caustic soda, and the mixture placed in a small flask, to which was adapted, by means of a tightly fitting cork, a bent glass tube, the end of which was allowed to dip slightly into 10 cubic centimetres of a decinormal solution of oxalic acid. The apparatus was so constructed as to prevent the possibility of any of the alkali passing mechanically into the distillate, and, as a further precaution, preference was given to caustic soda for saturating the acid, so that in case the smallest quantity passed over, it might be detected by the flame test, which, however, in every experiment failed to reveal a trace. Heat was then applied by means of a sand bath, until one-half or more of the liquid had distilled over. To the mixture of the distillate and oxalic acid solution, previously reddened with litmus, was added a decinormal solution of ammonia, the deficiency required for neutralization gave the cubic centimetres of a decinormal solution of ammonia equal to that contained in the diluted phosphoric acid, and, from this, the results in the subjoined table were calculated. With one exception, two experiments were made with each sample, and when there were any differences, which, however, were very slight, an average was taken upon which the calculations were based. From the proportion of phosphorus directed by the Pharmacopœia, there are found to be but 56·90 grains of actual phosphoric acid (H_3PO_4) in each fluidounce. Therefore, the foundation was comparatively small to build the estimation on. The following schedule gives the results, which, small as they may appear, were, nevertheless, readily obtained by the method above described.

	Cubic centimetres of decinormal solution of NH_4 found in fl. ʒi of Dil. Phos. Acid.	Amount of NH_4 in fl. ʒi of Dil. Phos. Acid.	Amount of H_3PO_4 neutralized by NH_4 in fl. ʒi Dil. Phos. Acid.	Percentage of H_3PO_4 combined with NH_4.	Amount of $(NH_4)_2HPO_4$ in fl. ʒi Dil. Phos. Acid.	Percentage of $(NH_4)_2HPO_4$ in Dil. Phos. Acid.
No. 1	0.70	.0194 grs.	.0529 grs.	.0926	.0711 grs.	.0147
No. 2	0.20	.0055 "	.0149 "	.0261	.0201 "	.0042
No. 3	1.55	.0430 "	.1170 "	.2056	.1576 "	.0327
No. 4	0.35	.0097 "	.0264 "	.0463	.0355 "	.0073

No. 3 yielded a much larger amount of ammonium than any of the others, which is accounted for by the fact of its having been prepared at a comparatively low temperature.

A moderate heat was employed in the preparation of No. 1, which, therefore, gave a smaller amount, while in the case of Nos. 2 and 4, the boiling temperature was applied, consequently a much smaller yield was obtained.

It is evident that these results are entirely too insignificant to be of any *practical* importance, yet, after all, as has been frequently stated by others, it is difficult to improve on the first process offered by the U. S. Pharmacopœia, against which the principal objection offered is the requisition of constant attention to prevent explosion or breakage; this, however, is not substantiated by the experience, either of myself or those of whom inquiry has been made.

HYDRARGYRUM IODIDUM RUBRUM AND OXIDUM FLAVUM.

BY CHARLES L. MITCHELL.

(*Read at the Pharmaceutical Meeting, February 15th.*)

The disadvantages arising from the use of mercuric chloride in the preparation of the above-named mercurials have long been known to pharmaceutists. Owing to its comparative insolubility in water, a large bulk of liquid is required in order to obtain any appreciable quantity of product, thus necessitating the use of large vessels when manufacturing in any quantity. Heat is also required, in order that the water shall take up as much of the mercuric chloride as possible, and thus lessen the disadvantage of bulky utensils. This, however, only partially removes the difficulty, and runs the additional risk of breakage of vessels, etc. It seems, therefore, that the corrosive sublimate used in the officinal processes for making the red iodide and yellow

oxide of mercury of the U. S. P., could be replaced with considerable advantage by some mercurial salt or preparation possessing the advantages of ready solubility, and concentration in small bulk of a considerable quantity of mercury. For this purpose, I would suggest the mercuric nitrate. It can readily be prepared by dissolving mercury in a slight excess of nitric acid, and then can be used either strong or diluted with water to any degree necessary. For general purposes, the officinal liquor hydrargyri nitratis answers admirably. Two troy ounces of liq. hydrarg. nit. (representing 384 grs. mercury) were diluted with an equal bulk of water, and then 660 grs. of iodide potassium dissolved in f℥iv water gradually added, until no farther precipitation took place. The resulting precipitate of red iodide of mercury was collected on a filter, washed with cold water, and then dried. It weighed 868 grs., being a difference of only a few grains from the estimated theoretical yield, and seemed to possess all the qualities of a good article. The manipulations necessary for the preparation of this salt were all conducted in a vessel of 8 ozs. capacity, and with the expenditure of about ten minutes' attention; whereas, if the officinal process had been followed, a vessel at least five times as large would have been required, and considerably more time needed. Another advantage can be also found in the fact that the process is considerably cheaper than that of the U. S. P. In practice, I have found it necessary to use a little more than the theoretical quantity of iodide potassium, in order to allow for moisture in the salt as well as to thoroughly insure the decomposition of the mercuric nitrate. On the other hand, care must be taken not to add a large excess of iodide potassium, on account of the solubility of the mercuric iodide. For preparing the mercuric iodide, I would therefore propose the following formula:

℞

Mercury,	1000 grs.
Nitric acid,	1700 grs.
Iodide potassium,	1662 grs. or q. s.
Distilled water,	q. s.

(Instead of the mercury and nitric acid ℥v ʒi ℈ii of liq. hydrarg. nit. can be used.)

Dissolve the mercury in the nitric acid by the aid of a little heat (in large quantities this is not necessary, as the reaction between the acid and mercury generates sufficient heat), and dilute with an equal bulk of water. Then add the iodide potassium, dissolved in 8 fluidounces of

water, until no farther precipitation ensues, being careful towards the last to add the solution very gradually, so as to avoid dissolving the mercuric iodide in an excess of the liquid. Collect the precipitate on a filter, wash well with distilled water, drain and dry.

The solution of mercuric nitrate also affords a very convenient way of preparing the yellow oxide of mercury, and I submit also a formula for its preparation.

Hydrargyrum Oxidum Flar.

℞

Sol. mercuric nitrate (prepared by dissolving mercury in an excess of nitric acid), . . any convenient quantity
Liq. sodæ, ... q. s.

Dilute the solution of mercuric nitrate with an equal bulk of water, and add liq. sodæ until in slight excess. Collect the yellow precipitate, wash well and dry. Sol. soda is used here instead of sol. potassa, as directed by the "Pharmacopœia," on account of its cheapness, there being no appreciable difference in the quality of the yellow oxide obtained from the two solutions.

For these formulæ I do not claim any special originality, but regard them only as affording, by the aid of a very common and easily-made preparation, a much more convenient and practicable method of preparing these mercurials than any other process of which I have knowledge. Their greatest merit lies in the fact that they can be prepared with much economy of both time and space, both important points to pharmaceutists whose facilities for manufacturing are of a rather limited character.

ON THE ASSERTED PRESENCE OF TANNIN IN GENTIAN ROOT.

BY JOHN M. MAISCH.

(*Read at the Pharmaceutical Meeting, February 15th, 1876.*)

The root of Gentiana lutea, owing to its importance as a medicine, has been frequently subjected to chemical analysis during the last sixty years, and none of the investigators have been able to prove the presence of tannin in it. The long list commences in 1815, with Schrader ("Berl. Jahrb. f. Phar.," xvi), who is followed by Henry, and by Guillemin and Foecquemin in 1818 ("Jour. de Phar.," v); in 1821 by Henry and Caventou (*ibid.*, vii); in 1836 by Denis (*ibid.*, 1836, January); in 1837 by H. Trommsdorff ("Ann. d. Phar.," xxi), and by Claude

Leconte ("Jour. de Phar.," xxiii); in 1838 by Dulk ("Arch. d. Phar.," xv); in 1847 by Baumert ("Ann. d. Chem. u. Phar.," lxii); in 1861 by H. Ludwig ("Arch. d. Phar.," clvii), and in 1862 by Kromayer (*ibid.*, clx). To these investigations must be added the recent ones by Hlasiwetz and Habermann ("Buchn. N. Repert.," 1874, p. 631; "Amer. Jour. Phar.," 1875, p. 207). It is true that many of these analyses were undertaken with the principal object of isolating the bitter principle or the gentianic (gentisic) acid; but it is hardly to be supposed that a principle like tannin, the presence of which is so readily proven, should have been overlooked. More particularly is this the case with the analyses of Henry and Caventou, Leconte and Dulk, the two former of which were undertaken for the purpose of ascertaining all the constituents, and that of Dulk verified the substantial correctness of the results of the former.

The results obtained by these chemists agree perfectly well with the physiological effects observed by numerous physicians, and which may be summed up with the words of Pereira: "Gentian is very properly regarded as a *pure* or *simple bitter;* that is, as being bitter, but without possessing either astringency or much aroma." Moreover, none of the works on Materia Medica, in the English, French and German languages, which the writer had occasion to consult, mentions tannin or a similar compound in this root.

In the face of these numerous investigations, it must appear rather startling to learn that Mr. E. L. Patch, in a paper recently read before the Massachusetts College of Pharmacy, asserted that "he found tannin in the gentian, contrary to the usual statement of works on Materia Medica" ("Drug. Circ.," 1876, p. 48). This assertion seems to be mainly based on "the incompatibility of the tincture of chloride of iron and the compound tincture of gentian," although it is stated that Mr. Patch exhibited numerous preparations of gentian in connection with his paper. Unfortunately, the gentleman seems to have overlooked the fact, that the tincture mentioned contains also orange peel, and that the white parenchyma of the latter is colored of a deep black on the addition of solution of any ferric salt, which coloration, according to Flückiger and Hanbury ("Pharmacographia," pages 105, 113), is owing, "*probably*, to a kind of tannic matter." It will be observed that the authors mentioned are very guarded in their expression, notwithstanding the ink-black coloration produced by iron salts.

But what is the effect of ferric salts upon gentian? The investigations mentioned above have thrown considerable light on this point. Henry already noticed the dark color produced by ferric chloride with what he supposed to be the bitter principle, but which was subsequently proven to be merely the yellow coloring principle contained in the root. Baumert says that the concentrated alcoholic solution of pure gentianic (gentisic) acid produces with ferric chloride a red-brown precipitate, and Ludwig found that the aqueous solution of the extract contains a body which, under certain circumstances, imparts a dark-green fluorescence. In these observations we have the key for the behavior of ferric salts with the preparations of gentian, which I shall endeavor to explain with the following experiments.

Well-dried and bruised gentian root was nearly exhausted by cold water, first by percolation and subsequently by expression after maceration. The first portion of the percolate gelatinized on standing a day or two, in consequence of the separation of pectin compounds. This aqueous infusion is not disturbed by gelatin solution, a pretty sure evidence of the total absence of tannin; in the course of a few hours, a scant light-colored precipitate made its appearance, which, after having been thoroughly washed with water is merely tinged light-brown by dilute ferric salts. The infusion, however, strikes with ferric chloride a dark reddish-brown color, which in reflected light shows a deep greenish tint; no precipitate takes place, as the liquid remains perfectly transparent in thin layers, although a concentrated infusion apparently becomes opaque on the addition of the iron salt, but after water is added shows not the slightest sign of a precipitate, even on standing. If the infusion has been previously diluted with water, the addition of ferric chloride will scarcely darken it.

Alcohol added to the cold infusion precipitates pectin compounds, albuminous and gummy matter, and the clear liquid behaves exactly as the infusion from which it had been made. The infusion preserved by alcohol was treated with a fragment of fresh hide for 24 hours; the behavior of the liquid to ferric chloride showed no difference. The experiments detailed prove conclusively that the aqueous infusion of gentian does not contain any tannin.

Gentain root, previously nearly exhausted with water, was now macerated, and then displaced with strong alcohol. The tincture thus obtained is of a bright yellow color, quite distinct from the yellowish-

brown color of the infusion or tincture prepared directly from unexhausted root. It gives, with ferric chloride, a deep brown-green color, and also a precipitate, if sufficiently concentrated; on diluting it with water, the mixture turns muddy from the separation of resin and fat, its color becoming of a dirty green-brown; if, instead of water, alcohol be added to the mixture, a perfect solution is obtained, having a brown color with a greenish tint. The tincture prepared from the nearly exhausted root is, therefore, likewise free from tannin.

In order to further elucidate the subject, a portion of the tincture was evaporated, and the residue washed with cold water to remove the remaining bitter principle, gentiopicrin. The clear, yellow filtrate evidently contains gentianic (gentisic) acid in solution, it yields, with ferric chloride, a deep brown color, without any percepible green tint. Dilution of the mixture with water revealed the absence of a precipitate.

The yellow granular mass left, after washing the alcoholic extract with water, was washed with cold ether to remove adhering resin and fat; on evaporation of the yellow etherial solution, a yellow amorphous mass was left, which, dissolved in a little alcohol, yields, with ferric chloride, a dark brown-green precipitate, the mixture becoming muddy on the addition of water, but perfectly transparent by alcohol.

The portion left undissolved by ether, consisting of nearly pure gentianic (gentisic) acid, was recrystallized by hot alcohol; but the quantity operated on being small, the acid was not obtained in an absolutely pure state. Its alcoholic solution behaved nearly like the solution of the etherial washings, except that the precipitate of the latter with ferric chloride, and its solution in alcohol, was of a more decided green color.

If it is remembered that gentianic (gentisic) acid is slightly soluble in water, not freely in ether, but readily in alcohol, the dark coloration imparted to various simple preparations of gentian by ferric salts is easily explained, likewise the dark-colored precipitate occurring by the same agent with fluid extract of gentian; and if it is remembered that alcohol takes up from gentian root also resin and fat, which are precipitated on the addition of water, the occurrence of a permanent precipitate in the presence of iron apparently remaining on diluting the alcoholic liquid with water, will likewise become obvious.

In proximate analysis it is of the utmost importance not to place any reliance upon any single reaction, much less when the test is applied in such complex mixtures as infusions and tinctures must necessarily be. While it is true that tannins produce, with iron salts, blueish-black or greenish-black colorations or precipitates, according to the state of concentration, it must be borne in mind that there are numerous other compounds which produce somewhat similar reactions, without being in the least related to the interesting group of tannins.

THE READY-MADE PILLS OF OUR DAY.

BY SAMUEL CAMPBELL, OF PHILADELPHIA.

A paper bearing the above title appears in the late Proceedings of the American Pharmaceutical Association, purporting to emanate from the pen of Joseph P. Remington, Professor of Pharmacy in the Philadelphia College of Pharmacy. Any one reading it carefully will find that the written statements and tabulated experiments do not agree as to the awards of merit in his classification of the various ready-made pills of our day. He writes that his tabulated results show the uncoated pill to be the most soluble, next in order the sugar coated pill, then the compressed or lenticular pill, then the gelatin coated pill. Mr. Remington starts out by making up a special uncoated pill, using as an excipient glycerin in both cases, which is not a fair or just criterion of the uncoated ready-made pill of our day. It should have been the regular officinal ready-made pill of the shop, usually made in strict accordance with the ingredients and excipients directed in the United States Pharmacopœia, and kept on hand for immediate dispensing. Mr. Remington then prefers the sugar coated pill as second in point of solubility.

If he will look over his experiments and reflect a moment, he will observe that he should have given the preference to the compressed pills, as it appears in his tables they were the only ones dissolved, all the others were only disintegrated, or as in the case of the cachets de pain the materials were only shaken out, (disintegration does not prove solubility),[1] and in the acidified solution of Pepsin the compressed

[1] We are informed by Professor Remington that the compressed quinia pill dissolves gradually without becoming disintegrated; it, therefore, presents to the liquid of the stomach and intestinal canal a limited surface to act upon, while the uncoated

pills were dissolved in the same time as the sugar coated pills. Again, the compressed compound cathartic pills assert their superiority in becoming disintegrated 15 minutes before the sugar coated pill. In the case of the uncoated compound cathartic pill, Mr. Remington uses the indefinite and impractical expression of "gone in 15 minutes." This implies a perfect solution of the pill, and when we take the ingredients into consideration, we know that they cannot be wholly dissolved in a weak alkaline solution. Another important fact, which Mr. Remington has overlooked, is that a sugar coated pill must first be deprived of its coating before the solvent reaches the pill itself, which he asserts is from 5 to 15 minutes. Two other points in this paper open to criticism are the shaking every 3 minutes, which in the case of the gelatin pills, occupied 18 and 24 hours. Query: How did Mr. Remington manage to shake the pills every 3 minutes during the night? Also, Mr. Remington neglects to state how he maintained a regular temperature of 80° and 98° for that length of time. And in order to further confirm the idea that Mr. Remington really intended to endorse the compressed pills as superior to all other ready-made pills of our day, he represents a machine in a wood-cut at the latter part of his paper, for making a pill that he has published as a third rate pill in point of solubility, which machine I find by tracing its history, is based on a machine found by Professor Remington among the stock which he purchased from the estate of the late A. Mosely, a graduate of our college, and his predecessor in business. Machines made after this model have been offered for sale by different parties, one of them by Messrs. H. C. Blair's Sons, styled the "Remington Pill Press." The machines, *four* of which I have experimented with, and find that they are not practically up to the standard for doing what they represent to do. A pill may be made by the machines with materials of a heavy or moist character, but not so readily with light dry substances, as I found that the machines required cleaning between every one or two pills made, with the chance of breaking them between the *dies*,[1] and in my judgment, endorsed by the

and sugar coated quinia pills being disintegrated, present the quinia in the state of powder, and consequently with a very large surface, so that its chances of dissolving rapidly in the stomach, appear to be far better than those of the compressed pill.—*Editor Amer. Jour. Phar.*

[1] I have, however, seen an improvement in one of the machines made at Mr. Remington's suggestion, which obviates the difficulty mentioned, as far as I had time to determine.—S. C.

experience of several pharmacists with whom I have conversed, that the waste of time and labor involved by their use, will ultimately consign them a place among the rubbish of drug stores.

I have thus criticised this paper from the fact that I have been engaged on this subject for some time past, deeming it one of importance to the members of both professions and the community. The following table of experiments were made from the various pills taken from stock on hand in my store, and were conducted conscientiously with a view of arriving at a true solution of which is the best ready-made form of pill for immediate dispensing by the retail pharmacist.

The following list of pills embrace all the known standard ready-made pills of our day, viz.: The officinal ready-made pills; the soluble pills from Schieffelin & Co., of New York; the sugar coated pills from many well-known houses; the gelatin coated pills from Keasbey & Mattison, of Philadelphia and from McKesson & Robbins, of New York; the compressed pills from Jacob Dunton and John Wyeth & Bro.; the medicated globules or pearls from E. Fougera & Co., of New York; also the cachet de pain, a French wafer, first introduced into this city by L. Dursse, of Baltimore, and thence through myself to the medical profession of this city. The points to be considered in such experiments, are the maintenance of a regular temperature, and to get a solution as nearly representing the gastric juice as possible, which, according to the latest authorities on physiology, consists of about 5 parts acid to 15 parts of pepsin, with traces of the chlorides of sodium, potassium, calcium and ammonium; also phosphates of lime, magnesia and iron, in 1,000 parts of liquid. In my experiments I used a hot water oven, in which heat was maintained at a regular desired temperature, by means of a Bunsen gas regulator as long as required, day and night. The pills were placed in small cylinders of tin, 1½ inches in diameter by ¼ inch deep, having gauze bottoms, and suspended in tumblers holding 12 fluidounces. The solvents used were water kept at a steady temperature of 100° Fahrenheit, and a mixture correspond ing to the gastric juice, as before described, and previously tested to prove its digestive power by its action upon albumen, also maintained at a temperature of 100° Fahrenheit, with the following tabled results:

Comparative Table, showing the time required for dissolving the different makes of Pills, as enumerated, in water, at 100° Fahrenheit, and in a solution corresponding to the gastric juice, at 100° Fahrenheit.

		Officinal.		Bullock & Crenshaw. Sugar coated.		McKesson & Robbins. Gelatin coated.		Jacob Dunton. Compressed.	
		Water. Temp., 100°.	Gastric Solution.	Water Temp., 100°.	Gastric Solution.	Water. Temp., 100°.	Gastric Solution.	Water. Temp., 100°.	Gastric Solution.
Quiniæ Sulph.,	2 grs	24 hours.	70 minutes.	36 hours.	80 minutes.	30 hours.	85 minutes.	24 hours.	25 minutes.
" Bisulph.,	2 "	45 minutes.	20 minutes.	.....	.....	9 hours.	50 minutes	10 minutes.	7 minutes
Potass. Iodid.,	5 "	.....	.....	5 hours.	3 hours.	.....	.....	2 minutes.	1½ minute.
Ammon. Murias,	5 "	.....	.....	.....	.....	.....	.....	6 minutes.	4 minutes.
" Carbonas,	5 "	.....	.....	.....	.....	.....	.....	2 minutes	Instantaneous.
" Bromid.,	1 "	.....	.....	3 hours.	2½ hours.	.....	.....	1 minute.	Instantaneous.
Ferri et Quin. Cit.,	5 "	.....	.....	2 hours.	1 hour.	2½ hours.	1 hour	20 minutes.	13 minutes.
Pepsin. Porci,	5 "	.....	.....	.....	.....	2 hours.	1½ hour.	90 minutes.	65 minutes.
Dover's Powder,	5 "	.....	.....	2 hours.	90 minutes.	.....	.....	60 minutes.	40 minutes.
Cathart. Comp.,		12 hours.	6 hours.	14 hours.	7 hours.	20 hours.	15 hours.	10 hours.	6 hours.
Rhei "		13 hours.	7 hours.	13½ hours.	7¼ hours.	15 hours.	12 hours.	12 hours.	6½ hours.
Rhei,		3 hours.	2½ hours.	3¼ hours.	3 hours.	10 hours.	8 hours.	2 hours.	90 minutes.
Potass. Bromid.,	5 "	.....	.....	5 hours.	3 hours.	.....	.....	6 minutes.	3 minutes.
Ferri Lact. Comp.,		.....	.....	4 hrs. 40 mins.	4 hours.	.....	.....	2 hours.	70 minutes.
Aloes et Mastiches,		11 hours.	7 hours.	15 hours.	9 hours.	12 hours.	8 hours.	10 hours.	6 hours.
Ferri Carb., Quin. and Strych.,		.....	.....	3 hours.	85 minutes.	.....	.....	2 hours.	65 minutes.

The makes of Pills enumerated above were selected as the best of their kind in the market, and as representing the standard Houses.
Where no results are announced, it was from the fact that they could not be procured, or were not made by the parties represented.

I found that all the pills described, with the exception of the Dunton compressed pill, contained excipients of some kind to keep them in pill form.

The Wyeth compressed pill was submitted to same test as the Dunton pill, but required one-fourth longer time to dissolve, whilst the solution of the quinine pills was cloudy, and had a very perceptible

odor of grease, evidencing the fact of the presence of some foreign matter in their composition. The objection that the pressure used in making a compressed pill renders it so compact and hard as to interfere with its solubility, was met by a microscopical examination, which shows that they are quite porous, which fact must practically aid in their solution or disintegration. The soluble pills, so-called, from Schieffelin & Co., of New York, are a handsome-looking pill, but are open to the same odjection as the gelatin coated pills, viz., irregularity in dissolving, requiring from 6 to 24 hours, swelling up in some instances as large as raisins, thereby materially interfering with the action of the solvent. The sugar-coated pills were taken from stock recently purchased from Messrs. Bullock & Crenshaw, W. R. Warner & Co. and Hance Bros. & White, all of this city. They required from 15 to 60 minutes to remove the coating, with evidence, in the iodide of potassium pills, of the presence of gum tragacanth and extract of gentian as excipients, swelling up after five hours as large as hazel nuts. The pill proper was, in all casses, hard and brittle, which must necessarily happen on account of the heat employed in coating the pill. Hence is it practical to suppose a sugar-coated pill to be as readily dissolved as one made without coating, with the ingredients merely pressed together without any adherent substance? The globules or pearls from E. Fougera & Co., of New York, are gelatin capsules, with the ingredients in a powdered form, free from excipients, and required from 30 to 60 minutes to dissolve their coating. Their size is an objection, however, yet they include in their list liquids such as apiol, turpentine, ether, phosphorated oil, &c., and the pearls should be classified with Cachet de Pain, and not as pills. They are perfectly reliable, and worthy the attention of the profession. The Cachet de Pain is, no doubt, an elegant mode of giving medicine, yet it is already murmured around by patients that they make a bulky dose.

The method of agitation also engaged my attention, as the one adopted by Mr. Jos. P. Remington to prove the solubility of the pills. I took four 6¼ oz. bottles, each containing 4 fluidounces of water at 70° F. In each bottle I placed a 2 gr. sulphate of quinia pill—one made with glycerin as an excipient, another B. & C.'s sugar coated, another McK. & R's gelatin coated, another Dunton's compressed. The bottles were attached to the eccentric rod of an upright steam engine, and speeded up to 350 revolutions a minute, with the following results: The Dunton compressed was dissolved in five hours, the

uncoated in seven hours, the sugar coated in eight hours, the gelatin coated in seven hours. I differ on this point also with Mr. Remington, as the digestive process of the stomach is not agitation, but more properly a churning or a circulatory displacement process, quiet but continuous in its mode of operation; hence my plan of suspending the pills in a large bulk of fluid and allowing the bulkier portion to be below the pills. Hence, after going carefully over the ground described, and as my tabled results will show, I find that in point of solubility the Dunton compressed pill surpasses all others. The second in point of solubility is the uncoated or officinal pill; third, the sugar coated; fourth, the gelatin coated. Although there is some difference between the two latter, yet they may be placed on the same footing, as the fact of their being coated excipient pills must create in the mind of any practical pharmacist or intelligent physician a doubt as to their more rapid solubility over a non-excipient or uncoated pill.

Philadelphia, Feb. 14th, 1876.

ON IODO-SULPHATE OF CHINIOIDIN AS AN EXCELLENT REAGENT FOR THE QUALITATIVE AND QUANTITATIVE DETERMINATION OF QUINIA.

BY DR. J. E. DE VRIJ.

Since I applied Herapath's discovery[1] of the remarkable compound of quinia with iodine and sulphuric acid to the quantitative determination of quinia in a mixture of Cinchona alkaloids,[2] it has often occurred to me that the use of an alcoholic solution of iodine has many inconveniences, for it requires a great deal of practice to add the *right* quantity. A *slight* excess of iodine is necessary to precipitate all the quinia; but if this excess is too great, a compound containing more iodine is formed, which is very soluble in alcohol. It appeared to me, therefore, desirable to abolish, if possible, the use of free iodine, and to obtain the same result by using a compound of iodine. For this purpose I tried the most soluble of the crystallizable iodo-sulphates described in Herapath's paper, viz., the iodo-sulphate of cinchonia. The alcoholic solution of this compound added to a solution of quinia in alcohol acidulated with sulphuric acid, really produces a precipitate of iodo-sulphate of quinia (herapathite), but the bulk of the reagent required to precipitate all the quinia was too great to answer my pur-

[1] "Pharmaceutical Journal," [1] vol. xi, p. 448, and vol. xii, p. 6.

[2] "Ibid," [3] vol. ii, p. 642. "Amer. Jour. Phar.," 1853, p. 137.

pose of applying it to the quantitative determination of quinia. After some experiments with the iodo-sulphate of chinioidin (wrongly called amorphous quinia,) I found that this compound is perfectly adapted for the required purpose, as its solubility in cold alcohol is great enough to make a concentrated alcoholic solution containing 16 per cent. or even more of it. This reagent is made as follows:

Two parts of sulphate of chinioidin,[1] are dissolved in 8 parts of water, containing 5 per cent. of sulphuric acid. To this *clear* solution, contained in a large capsule, a solution of one part of iodine and two parts of iodide of potassium in 100 parts of water, is *slowly* added under continuous stirring, so that no part of the solution of chinioidin comes into contact with an excess of iodine. By this addition, an orange-colored flocculent precipitate is formed of iodo-sulphate of chinioidin, which either spontaneously or by a slight elevation of temperature, collapses into a dark brown-red colored resinous substance, whilst the supernatant liquor becomes clear and slightly yellow-colored. This liquor is poured off,[2] and the resinous substance is washed by heating it on a water-bath with distilled water. After washing, the resinous substance is heated on the water-bath till all the water has been evaporated. It is then soft and tenacious at the temperature of the water-bath, but becomes hard and brittle after cooling. One part of this substance is now heated with 6 parts of alcohol of 92 or 94 per cent. on a water-bath, and is thus dissolved, and the solution allowed to cool. In cooling, a part of the dissolved substance is separated. The clear dark-colored solution is evaporated on a water-bath, and the residue dissolved in 5 parts of cold alcohol. This second solution leaves a small part of insoluble substance. The clear dark-colored solution obtained by the separation of this insoluble matter, either by decantation or filtration, constitutes the reagent which I have now used since the beginning of 1875, under the name of iodo-sulphate of chinioidin, both for the qualitative and quantitative determination of *crystallizable* quinia.

To determine the quantity of quinia contained in the mixed alkaloids

[1] Identical with "Sulphate of Amorphous Quinia, prepared according to Dr. de Vrij's process, by Messrs. Howard & Sons, Stratford.

[2] To prevent the use of an excess of iodine, I have prescribed on purpose not enough iodine to precipitate *all* the chinioidin in the form of iodo-sulphate. Therefore this liquor contains still chinioidin which can be obtained in a very pure state, if a little sulphurous acid is added before precipitating the alkaloid by caustic soda.

obtained from a sample of cinchona bark, 1 part of the alkaloids is dissolved in 20 parts of alcohol of 90 or 92 per cent., containing 1·6 per cent.[1] of sulphuric acid, to obtain an alcoholic solution of the acid sulphates of the alkaloids. From this solution, the quinia is separated by adding carefully, by means of a pipette, the above-mentioned solution of iodo-sulphate of chinioidin, as long as a dark brown red precipitate of iodo-sulphate of quinia (herapathite) is formed. As soon as all the quinia has been precipitated, and a *slight* excess of the reagent has been added, the liquor acquires an intense yellow color. The beaker containing the liquor with the precipitate, is now covered by a watch glass and heated on a water-bath till the liquid *begins* to boil.[2] After cooling, the beaker is weighed, to ascertain the amount of liquid, which is necessary in order to be able to apply later the above-mentioned correction. For although the quinia-herapathite is very little soluble in alcohol, it is not insoluble,[3] and, therefore, a correction must be applied for the quantity which has been dissolved both by the alcohol used for the solution of the alkaloids, and the alcohol contained in the reagent. The liquor is now filtered, to collect the iodo-sulphate of quinia, on a small filter, where it is washed with a saturated solution of herapathite in alcohol.[4] After the washing has been completed, the weight of the funnel with the moist filter is taken, and the filter allowed to dry in the funnel. As soon as it is dry, the weight is taken again to ascertain the amount of solution of herapathite which remained in the filter, and which left the dissolved herapathite on the filter after

[1] This quantity is quite sufficient to transform the alkaloids into acid sulphates, and ought not to be increased, for an excess of acid would increase the solubility of the herapathite in alcohol.

[2] If during the addition of the reagent to the solution of the mixed alkaloids, the liquid is not continuously stirred, it may happen that, if cinchonidia is present in large proportion relatively to quinia, as in Indian red bark, an orange-colored gelatinous precipitate is formed of an iodo-sulphate of cinchonidia If this happens, the liquid must be heated till this gelatinous precipitate disappears, before adding more of the reagent to precipitate all the quinia.

[3] Alcohol of 92 per cent., saturated with herapathite at a temperature of 24·5° C. left by evaporation 0·133 gram of herapathite.

[4] For my bark analysis, I always keep a supply of this solution, made by putting an excess of herapathite dried at 100° C. into alcohol of 92 per cent., and shaking from time to time. The temperature of the laboratory in which the analysis is made, is quite indifferent, provided that it is noted and does not change during the operation. It is clear that the amount of herapathite dissolved at that temperature in the alcohol must be ascertained, as this quantity varies with the temperature.

the evaporation of the alcohol. This amount is subtracted from the total amount of liquid, and, for the remaining, the correction is calculated with reference to the temperature of the laboratory during the time of the analysis. The dry iodo-sulphate of quinia is taken from the filter and dried on a water-bath, in one of a couple of large watch-glasses closing tightly upon each other, so that the weight of the substance contained in the glass may be taken without the access of the air. When, after repeatedly ascertaining the weight, it remains constant, this weight is noted down, and to it is added the product of the calculated correction. The sum of this addition is the total amount of iodo-sulphate of quinia obtained from the mixed alkaloids subjected to the operation, and from this weight the amount of *crystallizable* quinia can be calculated by the use of Hauers's formula, $2C_{40}H_{24}N_2O_4$, $3(HO, SO_3)$, 3 I (old notation), which I have found to be correct. According to this formula, 1 part of iodo-sulphate of quinia dried at 100° C. represents 0·5509 part of anhydrous quinia or 0·7345 part of pure commercial disulphate of quinia.[1]

The accuracy of this determination may be proved by the following examples:

0·294 gram of anhydrous crystallized quinia, kindly presented to me by Dr. O. Hesse in October, 1873, gave 0·541 gram of herapathite dried at 100° C.=0·298 gram of quinia.

According to Hauers's formula, I ought to have obtained 0.5336 gram of herapathite=0·294 gram of quinia.

1·048 gram of bitartrate of quinia gave 1.224 gram of herapathite= 0.674 gram of quinia.

According to the formula of the bitartrate $C_{20}H_{24}N_2O_2$, $C_4H_6O_6$+ Aq=492; 1·048 of bitartrate represent 0·69 of quinia, so that I ought to have obtained 1·255 gram of herapathite.

[1] Although, as Mr. Umney stated at the Pharmaceutical meeting on Wednesday, November 3, 1875, "manufacturers only believed in the crystallizable sulphate of quinia which they could see and weigh," I suppose they will equally be satisfied by seeing and weighing the quinia herapathite obtained by the analyst from a certain amount of bark; for, not only can this compound be easily distinguished from the similar compounds of the other Cinchona alkaloids, but by dissolving it in sulphurous acid and precipitating the solution by caustic soda, quinia is obtained, which may be easily transformed into crystallized sulphate.

Notwithstanding the different circumstances in which the reagent was applied, the results seem to me satisfactory.

The two following experiments were made with pure quinia, dried at 100° C., at which temperature it still retains water, under identical circumstances:

1·0664 gram of hydrated quinia gave 1·7266 gram of herapathite= 164·5 per cent.

1·055 gram of the *same* hydrated quinia gave 1·7343 gram of herapathite=164·3 per cent.

Although I feel convinced that this process of estimating the amount of quinia in a mixture of Cinchona alkaloids, is not one which, *even in the hands of inexperienced persons, shall give accurate results in a short time*, I have some hope that in the hands of experienced analysts, it may prove a satisfactory one, if, before applying it, they study, as I have done, the action of the reagent upon solution of 1 gram of quinia, quinidia, cinchonia and of cinchonidia, each of them separately in 20 grams of the above-mentioned acidulated alcohol. If they do so, they will find that the iodo-sulphates of quinia and of quinidia, thus obtained, have an analogous composition, and are identical with the compounds described by Herapath,[1] whilst the iodo-sulphates of cinchonia and cinchonidia have a different composition from the former, and both require more iodine to be transformed into the optical iodo-sulphates described by Herapath. In the meantime, they will find that of all these iodo-sulphates, that of quinia is the most insoluble in alcohol, as has been stated already by Herapath in the paper above quoted, and is therefore precipitated the first of all and *alone* by a *judicious* addition of the iodo sulphate of chinioidin.

I do not in the least pretend to have exhausted the subject, but on the contrary, I hope that my paper may lead to a still better process. Thus, for instance, I feel some hope that it may be possible to apply the alcoholic solution of iodo-sulphate of chinioidin to volumetric analysis, and, therefore, I presented a specimen of it to Mr. Sutton, the author of the valuable work "On Volumetric Analysis," when he was so kind as to call upon me at the Hague last summer.—*The Phar. Jour. and Trans.*, December 11, 1875.

[1] "Proceedings of the Royal Society," vol. ix, p. 10.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Preparation of pure Iodide of Potassium.—If an aqueous solution of potassium iodide, containing iodate, is treated with sulphuretted hydrogen, the iodate is reduced, some sulphuric acid being formed at the same time, so that the iodide may contain 1 to 2 per cent. of sulphate, which may be decomposed by barium iodide. A simpler and more interesting method of purification consists, according to G. Pellagri, in shaking a warm solution of the impure iodide with iron filings, which produces complete reduction of the iodate, no iron being dissolved, nor is iodine found in the ferric oxide formed. In a concentrated solution, the ferric oxide will ultimately exert an oxidizing influence upon the iodide, and the complete reduction of the iodate is only possible if the liquid is filtered and repeatedly treated with fresh iron filings. Complete reduction of the iodate is effected in the cold by immersing in the liquid an iron and a copper plate, and forming them into a galvanic element by uniting them, outside of the liquid, with a wire; the iron only becomes oxidized, but no loss of iodine or contamination with iron or copper takes place. Potassium bromate is likewise promptly reduced by the iron-copper couple, but the chlorate is but incompletely acted upon.

Powdered zinc acts, at first, energetically upon potassium iodate, but does not effect complete reduction.—*Schweiz. Woch. f. Pb.* 1875, No 50, from *Ber. Chem. Ges.*

The Devorative Capsules, noticed on page 31 of our January number, appear to be made principally of gelatin. In a warm place, or if handled with moist fingers, they readily become adhesive and lose their gloss, at least in the places touched. They are folded neatly with difficulty only, and are, for the apothecary, very inconvenient, much more so than the wafer capsules, which are readily closed with a very simple apparatus. Another disadvantage of the new capsules is their unsightly appearance, due to their greyish color.—*Ibid.*, No. 51.

Iodinized Cotton.—Cotton, if dipped into a concentrated solution of iodine in ether or carbon bisulphide, retains, after drying, only traces, but no definite amount of iodine. Méhu impregnates cotton with 5 or 10 per cent. of iodine, by sprinkling it over layers of cotton, contained in a bottle, which is then warmed in a horizontal position in a sand or water bath. As soon as the warm air has been expelled, the bottle is tightly closed; the vapors of iodine penetrate the fibres and color the cotton yellow, the color gradually becoming deeper, finally resembling roasted coffee, when the operation, which requires about two hours, is finished.—*Zeitschr. Oesterr. Apoth. Ver.*, 1876, No. 3, from *Jour. de Phar. et de Chim.*

Examination of Volatile Oil of Mustard.—Hager observes that the solubility of this oil, in water, is variable; old oil required only 120, fresh oil about 230 parts of water of medium temperature for solution. Agitated with three times its volume of concentrated sulphuric acid, the mixture remains clear and becomes thick like syrup, after 12 hours, or is converted into a crystalline mass.—*Phar. Cent. Halle*, 1875, No. 43.

Elisa Galeer's liquid for promoting the growth of the hair is a filtered mixture of 15 grams ammonia water, 20 grm. glycerin, 50 grm. alcohol, 10 drops each of the oils of rue, lavender and bergamot, and 200 grms. of water.—*Ibid.*

Insoluble Cement for Glass is obtained, according to Prof. H. Schwarz, by dissolving one part of bichromate of potassium for every 5 parts of gelatin, or glue, in a solution containing from 5 to 10 per cent. of the latter. After having been applied to the glass, the cement, on exposure to the sunlight, loses its property of swelling and dissolving in water, in consequence of the partial reduction of chromic acid.—*Ibid.*, No. 45.

Estimation of Vanillin in Vanilla.—F. Tiemann and W. Haarmann exhaust finely cut vanilla with ether, the solution is somewhat concentrated by evaporation, and then repeatedly agitated with two portions of a mixture consisting of equal volumes of water and concentrated solution of sodium bisulphite. The mixed aqueous solutions, containing the vanillin, are treated with some sulphuric acid, the liberated sulphorous acid is expelled by a moderate heat, and the vanillin extracted by agitation with ether. On the evaporation of the ether, and drying over sulphuric acid, pure vanillin is left behind.

The authors obtained, by this method, from Mexican vanilla 1·69, from Bourbon vanilla 1·91 and 2·48, and from Java vanilla 2·75 per cent. of vanillin, which, in the two last named varieties, is associated with an oil of a disagreeable odor, whereby its flavor is modified.—*Ibid.*, No. 47, from *Ber. Chem. Ges.*

Soluble Blood Powder is obtained, according to G. LeBon, by evaporating the blood under decreased pressure and at a temperature not exceeding that of the body. The author submitted a sample, 18 months old, to the Paris Academy. By agitation with water it was, in a few minutes, converted into a fine red solution, possessing all the properties of defibrinated blood, showing the same behavior in the spectroscope and coagulating on boiling. It is soluble in an acidulated solution of pepsin, and is recommended as very nourishing.—*Chem. Centralbl.*, 1875, No. 51, from *Compt. rend.*, lxxxi.

A good Copying Ink from Extract of Logwood is obtained by treating 250 grams of coarsely powdered American extract of logwood in a suitable bottle, with 3 kilos distilled water. When this is completely saturated with the soluble coloring matters, say in about one or two weeks, the clear solution is carefully decanted from the sediment, about 20 grams of acetate of manganese, dissolved in a little water, are added to the liquid, the whole is well mixed, and solution of acetate of iron carefully dropped in, until a deep violet-blue color is obtained. It is advisable to set the mixture aside for a few days to ascertain the change of color produced. The ink must be protected from the influence of the sunlight, and instead of gum arabic, solution of dextrin or sugar is preferably added to it.—*Ibid.*, No. 52, from *Ind. Bl.*, xii

Solubility of Oils in Glacial Acetic Acid.—Mr. Barnes' experiments on this subject (see page 29 of January number), were made with an acid solid at 48° F. Mr. W. H. Symons, using acetic acid, remaining solid up to 60° F., found that one volume of it will dissolve in 4 vols. of almond, olive, cod liver and linseed oil, and mix in all proportions with the oils of turpentine and lemon. He also gives the following formulas for

Linimentum Terebinthinæ Aceticum: oil of turpentine, 4 fluidounces; glacial acetic acid, solid at 60° F., 1 fluidounce, and camphor liniment, 4 fluidounces.

The following furnishes a liniment which is miscible with spirit in the proportion of one to seven, and with oils in any proportion, and which retains its transparency at a temperature considerably below the freezing point of water: camphor, 240 grains; oil of turpentine, 2 fluidounces; dissolve, filter and add castor oil, 2 fluidounces, and glacial acetic acid, solid at 60° F., 4 fluidrachms.—*Pharm. Jour. and Trans.*, 1875, Oct. 16.

Ammoniacum, according to Prof. W. Dymock, is received, at Bombay, in bales containing all parts of the plant, broken up and encrusted with the gum resin, which appears to exude from every part, even the fruit being coated with it, and to be collected after the plant has matured its fruit. In Bombay it is picked and usually sorted into three qualities, large, middle-sized and small tears, the latter often containing dirt and other refuse. If kept during the monsoon, the tears get soft and unite into a lump.

Dorema root is an article of commerce in Bombay, being imported from Persia under the name of *Boi*, and used in the Parsee fire temples as an incense. It has a thin, papery bark, like sumbul root, but is compact and has a resinous section, its texture becoming loose and spongy by age and the ravages of insects. Some years ago it was sent to Europe as Bombay sumbul, after having been cut up and impregnated with musk.—*Ibid.*, Oct. 23.

Tellurium a probable impurity in bismuth salts.—Mr. Charles Ekin, having called attention to the intolerable smell of garlic imparted to the breath of patients, after having taken a simple bismuth mixture, publishes extracts from some letters, showing that similar observations have been made by others. Mr. Geo. Brownen attributes this effect to the presence of tellurium, and both gentlemen are now engaged in further investigating this subject.—*Ibid.*, Dec. 25.

VARIETIES.

BALSAM PERU ADULTERATED WITH ALCOHOL.—A. Gavalowski recommends the following test as being easier of execution and as reliable as the distillation test: Add a few drops of the balsam to a solution of potassium bichromate in a test-tube, and then add concentrated sulphuric acid. In the presence of alcohol aldehyd will be formed, the smell of which (somewhat similar to that of rotten apples) will be distinctly perceived, since it quite covers that of the balsam itself. Even mere traces of alcohol are said to be recognizable.—*Pharm. Centralh. in Ny pharm. Tid.*, 1875, p. 345. H. W.

MISTURA GLYCYRRHIZÆ COMPOSITA.—A. F. W. Neynaber proposes in the "Druggists' Circular" for February, the following modification of the officinal formula:

"Take half a troyounce of best Calabria liquorice, cut it into slices about ¼ inch thick, introduce it into a glass percolator or funnel, using cotton and linen at the bottom and short straw as a layer between the liquorice, and having closed the out-

let with a cork, provided with a little notch on the tapered end (if the apparatus has no stop-cock), pour upon it 12 fluidounces of cold distilled water, set it aside for 24 hours, then loosen the cork so as to allow the liquid to fall in drops, and let it percolate through, adding water in sufficient quantity until 13 fluidounces have been obtained. To this add half a troy ounce of gum arabic, bruised, stir occasionally, and when it has dissolved, add half a troy ounce of sugar; stir, heat the mixture to the boiling point, strain, and allow it to cool off, adding, if necessary, distilled water to make it weigh 13½ troyounces. To this perfectly clear liquid add camphorated tincture of opium, 2 fluidounces, wine of antimony, 1 fluidounce, spirit of nitrous ether, ½ fluidounce, and mix.

"By this process starch and other impurities will be left behind in the funnel or percolator, the mass retaining almost its original shape (being merely a skeleton), while the liquorice will be exhausted."

It will be observed that this is essentially the same formula suggested by Mr. Wilder on page 97 of our last volume, differing mainly in the recommendation to *boil* the solution of extract, gum and sugar.

LACTOPEPTIN.—The following formula for this preparation is copied from the "Oil, Paint and Drug Reporter," of January 26th:

Sugar of milk,	20 ounces
Pepsin, pure,	4 ounces
Paucreatin, pure,	3 ounces
Ptyalin or diastase,	1 drachm
Lactic acid,	2½ fl. drachms
Hydrochloric acid,	2½ fl. drachms

Powder and mix.

QUINETUM.—A preparation of the whole alkaloids, separated from East India red bark, has been used for some time in the Indian hospitals, as well as in private practice, with great success. The concurrent testimony of medical men in our Indian possessions is to the effect that quinia is not so greatly superior to the whole alkaloids as to make it worth while to separate the sulphate in its pure state. Mr. Thomas Whiffen, of the Quinine Works, Battersea, now offers to the profession a similar preparation, which he calls quinetum. It is in the form of a fine granular non-adherent powder of a pale buff color. The proportions of the various alkaloids present will, of necessity, vary with the sample of bark used, but we think not so much as to be of moment therapeutically. Sulphate of quinetum is a white crystalline body with a faint pink tinge, greatly resembling sulphate of quinia; and we are informed that the preparation can be supplied to the profession at about one-half of the cost of quinine.—*Medical News*, Jan., 1876, from *Brit. Med Journ.*, Nov. 27, 1875.

THERMIC RESEARCHES ON PHOSPHORIC ACID. By MM. Berthelot and Louguinine.—M. Thomsen, having repeated the experiments of Graham in 1869 ("Poggendorff's Annalen," cxl, 90 and 94), concluded that phosphoric acid was not a true tribasic acid, but rather a bibasic and triatomic. The authors, having re-ex-

amined this subject, conclude that the three equivalents of base successively united with phosphoric acid are combined in different manners, the first being comparable to the base of the nitrates and chlorates, the second to that of the carbonates and borates, and the third to the base of the alkaline alcoholates.—*Chem. News*, Dec. 31, 1875.

CONSTITUTION OF THE PHOSPHATES. By MM. Berthelot and Louguinine.—In this memoir the authors examine the formation of an insoluble phosphate, that of baryta; they undertake an alkalimetrical study of phosphoric acid; and, finally, they seek to define the displacements and reciprocal distribution of an alkaline base among phosphoric acid and the nitric, hydrochloric and acetic acids. They conclude that phosphoric acid is not a tribasic acid of the same kind as citric acid, as the third equivalent of a soluble base is separated from phosphoric acid by the feeblest actions, and even by dilution. With ammonia it happens that the third basic equivalent does not combine with phosphoric acid, or if it combines at first it does not remain definitely united to the acid, but is gradually separated spontaneously and completely. Neither is phosphoric acid a bibasic acid in the same sense as are the sulphuric, oxalic or tartaric acids. The second base, as alkalimetrical operations show, is not neutralized by phosphoric acid, and is entirely separated by the hydrochloric and nitric acids, and gives indications of division even with acetic acid. In short, the three equivalents of base united in the phosphates considered as normal, are combined in different and unequal manners. Phosphoric acid must be regarded as a monobasic acid of a mixed function.—*Chem. News.*, Jan. 7, from *Compt. Rend.*

AMERICAN QUICKSILVER.—Mr. J. B. Randol, General Manager, gives the production of the New Almaden mine for the year 1875, in flasks of 76½ lbs. each, as ollows:

Months.	Flasks.	Months.	Flasks.
January,	850	July,	1,220
February,	800	August,	1,100
March,	1,033	September,	1,200
April,	850	October,	1,250
May,	1,095	November,	1,700
June,	1,050	December,	1,500
Total,			13,648

The total product of the mine for 1874 was 9,084 flasks, making the increase this year 4,564 flasks, or nearly 50 per cent.—*Scientific American*, Feb. 26, 1876.

CONSTITUENTS OF WOOD-TAR CREASOTE. By Ferd. Tiemann and Benno Mendelsohn.—The portion of Rhenish wood tar creasote boiling at 200°—230°, was dissolved in ether and the solution agitated with potash. The aqueous liquid, after separation from the ether, was acidified, and the oil thereby liberated was separated by fractional distillation into two portions boiling at 195°—212° and 217°—226° respectively. The latter consisted of phlorol and creosol.

Methylcreosol (*Dimethylhomopyrocatechin*).—This body was obtained thus: The

foregoing mixture of phlorol and creosol, dissolved in alcohol and mixed with a slight excess of potash, was evaporated till it began to crystallize, and the crude creosol-potassium salt thereby formed was dissolved in methyl alcohol and boiled with excess of methyl iodide. The product was a dense oily body, distilling for the most part at 214°—218°.

Methylcreosol is a transparent, heavy liquid, of not unpleasant odor when pure, insoluble in water and dilute alkalies, but easily soluble in alcohol and ether.

Dimethylprotocatechuic Acid.—Methylcreosol was oxidized by heating it with a dilute solution of potassium permanganate. The product was an acid, crystallizing in long prisms, dissolving sparingly in water and freely in alcohol and ether, melting at 174°, and having the composition of dimethoxybenzoic acid. By gentle fusion with potassium hydrate it was converted into pyrocatechuic acid. This decomposition and its melting point characterize the body as dimethylprotocatechuic acid.

Creosol is therefore a derivative of protocatechuic acid, and must be regarded as methylated methylpyrocatechin or homoguaiacol.

Indifferent Oils of Wood-tar Creasote.—The etherial solution above mentioned contained an oil boiling at 214°—218°, which was separated by fractional distillation. This body yielded by oxidation dimethylpyrocatechuic acid, and therefore consisted of methylcreosol or dimethylhomopyrocatechin. Other oils present in the etherial solution are being examined by the authors.—*Journ. Chem. Soc.* [*Lond.*], Jan., 1876, from *Deut. Chem. Ges. Ber.*, viii, 1136–1139.

Reactions of Saccharine Matters. By M. Vidau.—A mixture of equal parts of commercial hydrochloric acid and of a fatty oil, but especially of oil of sesame, is a very delicate test for sugar, glucose, levulose, honey, &c. The oil and acid are shaken together for some minutes, and the mixture is heated until the acid liquid begins to boil, then the acid is allowed to subside and its color is observed. When oil of sesame is used, the subsequent addition of one-tenth of a milligram of inverted sugar suffices to produce a characteristic rose color. The reaction is distinct with a liquid containing one 20,000th of inverted sugar, and detects a milligram of that substance when dissolved in a cubic centimeter of normal urine.—*Ibid.*, from *J. Pharm. Chim.*, [4], xxii, 33.

A New Preparation of Santonin.—Albuminated sodium santonate has recently been much recommended as an anthelmintic. It is prepared by gently heating in a porcelain dish a mixture of four parts of sodium bicarbonate, one part of santonin and two parts of dried, soluble egg or blood albumen with a small quantity of water, until a solution is effected; this is evaporated to dryness and subsequently redissolved in a sufficient quantity of warm water; the filtered solution is evaporated, at a gentle heat, to dryness. The remaining albuminated sodium santonate forms colorless, shining scales, readily soluble in water, rendering an alkaline solution which, upon addition of acids, separates santonin with the evolution of carbonic acid from an excess of sodium carbonate.—*Med. and Surg. Reporter*, Feb. 19, 1876.

PHARMACOPŒIA OF THE PHILADELPHIA HOSPITAL. (Concluded.)—

Linimentum Terebinthinæ Compositum.

℞
Olei terebinthinæ,
Aquæ ammoniæ fortioris, āā f℥i
Linimenti saponis, f℥iv
Fiat linimentum.

Liquor Bromini.

℞
Bromini, ℥i
Aquæ, f℥ii
Potassii bromidi, q.s. ut fiat solutio.
Signa—For physicians' use only.

Liquor Plumbi Subacetatis cum Opii.
(*Lead-water and Laudanum.*)

℞
Tincturæ opii, f℥ii
Liquris plumbi subacetatis diluti, q. s. ad Oii
Misce.

Mistura Antirheumatica

℞
Potassii nitratis, ℥i
Vini colchici radicis, f℥i
Spiritus ætheris nitrosi, f℥i
Syrupi guaiaci, f℥ii
Olei gaultheriæ, gtt. vi
Aquæ, q. s. ad f℥vi
Misce. Signa—Dose, a tablespoonful every two hours.

Mistura Arsenicalis Composita.

℞
Liquoris arsenici chloridi, f℥ss
Tincturæ ferri chloridi, f℥iss
Cinchoniæ sulphatis, ℥ii
Strychniæ sulphatis, gr. ii
Syrupi,
Aquæ, āā q. s. ad f℥vi
Fiat mistura Signa—Dose, a teaspoonful.

Mistura Astringens.

℞
Acidi sulphurici aromatici, f℥ii
Extracti hæmatoxyli, ℥ii
Tincturæ opii camphoratæ f℥ss
Syrupi zingiberis, q. s. ad f℥vi
Misce secundem artem. Signa—Dose, a tablespoonful.

Mistura Cosmetica.
(*Goddard's Cosmetic Lotion.*)

℞
Tincturæ benzoini, f℥ii
Hydrargyri chloridi corrosivi, gr. vi
Aquæ rosæ, f℥vi
Fiat mistura.

Mistura Cretæ Composita.

℞
Tincturæ catechu,
Tincturæ opii camphoratæ, āā f℥vi
Acidi carbolici, gtt. xii
Mistura cretæ, q. s. ad f℥vi
Misce secundum artem. Signa—Dose, a tablespoonful.

Mistura Ferri Chloridi Composita.
(*Basham's Mixture.*)

℞
Liquoris ammonii acetatis, f℥iii
Tincturæ ferri chloridi, f℥iiss
Acidi acetici diluti, f℥i
Curacoa vel alcohol, f℥ii
Syrupi,
Aquæ, āā q. s. ad f℥vi
Fiat mistura. Signa—Dose, a tablespoonful.

Mistura Ferri cum Quiniæ.

℞
Quiniæ sulphatis, ℥i
Acidi phosphorici diluti, q. s.
Ferri pyrophosphatis, ℥ss
Mistura aromaticæ, q. s. ad f℥xxx
Misce secundum artem. Signa—Dose, a tablespoonful, containing 1 gr. of quinia and 4 grs. of iron.

Mistura Sodæ.
(*Soda Mint.*)

℞
Sodii bicarbonatis, ℥ii
Spiritus ammonii aromatici, gtt. [xxxvi
Aquæ menthæ viridis, f℥viii
Misce. Signa—Dose, one or two tablespoonfuls three times a day.

Mistura Sodæ Composita.

℞
Sodii bicarbonatis, ℥ii
Creasoti, gtt. xii
Syrupi acaciæ, f℥ii
Spiritus lavandulæ compositi, f℥iss
Aquæ, q. s. ad f℥vi
Fiat mistura. Signa—Dose, tablespoonful two hours after meals.

Mistura Zollickofferi.
(*Zollickoffer's Mixture.*)

℞
Potassii iodidi,
Pulveris guaiaci resinæ, āā ʒiiss
Vini colchici radicis, f℥iss
Aquæ cinnamomi,
Syrupi, āā q. s. ad Oi
Fiat mistura. Signa—Dose, a tablespoonful.

Chlorodyne.

℞

Chloroformi,	f℥ss
Spiritus ætheris sulphurici,	f℥iss
Olei menthæ piperitæ,	gtt. viii
Oleoresinæ capsici,	gtt. ii
Extracti cannabis indicæ,	gr. vi
Morphiæ muriatis,	gr. xvi
Acidi hydrocyanici diluti,	♏lxv
Acidi hydrochlorici diluti,	f℥i
Glycerinæ,	
Mellis,	āā q. s. ad f℥iv

Fiat mistura secundum artem. Signa—Dose, 15 to 20 drops.

Pilulæ Aloes Compositæ.

℞

Pulveris Aloes Socotrinæ,	℥ss
Ferri sulphatis exsiccatæ,	
Terebinthinæ albæ,	āā ℥ii

Misce et fiant pilulæ cxx.

Signa—Each pill contains 2 grs. of aloes and one gr. each of iron sulphate and turpentine.

Pilulæ Antineuralgicæ.

Acidi arseniosi,	gr. iv
Strychniæ sulphatis,	gr. iii
Extracti belladonnæ,	gr. xxiv
Cinchoniæ sulphatis,	℥iii
Pilulæ ferri carbonatis,	℥v

Misce, et fiant pilulæ cxx.

Signa—Each pill contains 1-30th gr. of arsenic, 1-40th gr. of strychnia, 1-5th gr. of belladonna, 1½ gr. of cinchonia, and 2½ gr. of Vallet's mass.

Pilulæ Cinchoniæ et Arsenici.

℞

Cinchoniæ sulphatis,	
Ferri redacti,	āā ℥ss
Extracti nucis vomicæ,	gr. xxx
Acidi arseniosi,	gr. vi

Misce, et fiant pilulæ cxx.

Signa—Each pill contains 1-20th gr. of arsenic, ¼ gr. of nux vomica, and 2 grs. each of iron and cinchonia.

Pilulæ Colocynthidis cum Belladonnæ.

℞

Extracti belladonnæ,	gr. xv
Extracti colocynthidis compositi,	
Pulveris aloes socotrinæ,	āā ℥iii
Olei anisi,	gtt. xxx

Misce, et fiant pilulæ cxx.

Signa—Each pill contains ⅛ gr. of belladonna, and 1½ grs. each of aloes and colocynth.

Pilulæ Cinchoniæ Compositæ.

℞

Cinchoniæ sulphatis,	
Ferri redacti,	āā ℥ss
Extracti nucis vomicæ,	gr. xxx

Misce, et fiant pilulæ cxx.

Signa—Each pill contains ½ gr. of nux vomica and 2 grs. each of iron and cinchonia.

Pilulæ Opii cum Plumbi Acetate.

℞

Pulveris opii,	gr. xl
Plumbi acetatis,	℥ss

Misce, et fiant pilulæ cxx. Signa—Each pill contains ½ gr. of opium, and 2 grs. of acetate of lead.

Pilulæ Podophylli Compositæ.

℞

Resinæ podophylli,	gr. xx
Extracti colocynthidis compositi,	
Extracti hyoscyami,	āā ℥ii

Misce, et fiant pilulæ cxx.

Signa—Each pill contains 1-6th gr. podophyllin, and 1 gr. each of colocynth and hyoscyamus.

Pilulæ Rhei et Gentianæ.

℞

Pulveris rhei,	℥ss
Extracti gentianæ,	
Extracti hyoscyami,	āā ℥ii

Misce, et fiant pilulæ cxx. Signa—Each pill contains 2 grs. of rhubarb, and 1 gr. each of gentian and hyoscyamus.

Pulvis Glycyrrhizæ Compositus.

℞

Pulveris sennæ,	
Pulveris glycyrrhizæ radicis,	āā ℥vi
Pulveris fœniculi,	
Sulphuris loti,	āā ℥iii
Sacchari albi,	℥xviii

Misce. Signa—Dose, a teaspoonful at bed-time.

Pulvis Sodæ Compositus.

℞

Bismuthi subnitratis,	gr. v
Sodii bicarbonatis,	
Pulveris zingiberis,	
Pulveris calumbæ,	āā gr. iiss

Misce.

Syrupus Chlorali.

℞

Chloralis hydratis,	℈lxiv
Tincturæ cardamomi,	f℥i
Syrupi,	f℥iv
Aquæ cinnamomi,	q. s. ad Oi

Misce. Signa.—A teaspoonful contains 10 grs. of chloral.

Syrupus Guaiaci.

℞

Pulveris guaiaci resinæ,	℈xxxii
Liquoris potassæ,	f℥ss
Sacchari albi,	lbi, (avoird.)
Aquæ,	f℥viii

Fiat syrupus. Signa—Dose, a teaspoonful, containing 5 grs. of guaiacum.

Syrupus Pectoralis.

℞

Ammonii chloridi,	℥ss
Syrupi senegæ,	f℥i
Misturæ glycyrrhizæ compositæ, q s.	[ad f℥viii

Misce. Signa—Dose, a dessert-spoonful.

Syrupus Potassii Iodidi.

℞

Potassii iodidi,	℥i
Syrupi sarsaparillæ compositi, q. s.	[ad f℥vi

Misce. Signa—Dose, a dessert-spoonful, containing 20 grs. of iodide.

Syrupus Potassii Iodidi Compositus.

℞

Hydrargyri chloridi corrosivi,	gr. ii
Potassii iodidi,	℥i
Syrupi sarsaparillæ compositi, q. s.	[ad f℥vi

Misce. Signa—Dose, a dessert-spoonful, containing 1-12 gr. of mercury, and 20 grs. of potassium iodide.

Tinctura Aromatica.

℞

Coriandri fructus,	℥ii
Angelicæ fructus,	℥iiss
Glycerinæ,	f℥v
Syrupi,	f℥vi
Alcoholis diluti, q. s ut fiant tinctura,	Oii

Signa—A pleasant vehicle for administering nauseous remedies.

Tinctura Ferri Composita.

℞

Cinchoniæ sulphatis,	℥i
Strychniæ sulphatis,	gr. ii
Tincturæ ferri chloridi,	f℥i
Syrupi,	
Aquæ,	āā q. s. ad f℥viii

Misce secundum artem. Signa—Dose, a teaspoonful 3 times a day.

Tinctura Saponis Viridis cum Pice.

℞

Picis liquidæ,	
Saponis viridis,	
Spiritus methylici,	āā ℥i

Misce cum leni colore.

Tinctura Styptica.

℞

Potassii carbonatis,	℥i
Saponis,	℥ii
Alcoholis,	f℥iv

Fiat mistura secundum artem.

Unguentum Plumbi Oxidi.

℞

Emplastri plumbi,	℥i
Olei olivæ,	f℥ii

Misce cum leni calore.

Unguentum Zinci Oxidi Benzoatum.

℞

Zinci oxidi,	℥ī
Tincturæ benzoini,	gtt. xl
Adipis,	℥vii

Fiat unguentum.

MINUTES OF THE PHARMACEUTICAL MEETING.

The meeting was called to order at 8.15 P. M. The President and Registrar being absent, their offices were filled by the election of Mr. A. P. Brown and Richard V. Mattison to their respective positions.

The minutes of the previous meeting were read, corrected and approved, the correction being that the glycerin dropper, exhibited at our last meeting, was not the invention of Mr. Bowman, but of Mr. H. W. Wharton, of Nashville, Tenn. (See p. 99).

Prof. J. M. Maisch presented, from the British Pharmaceutical Conference, "The Year Book of Pharmacy," and also a pamphlet, by Prof. Mark W. Harrington, of the University of Michigan, on "The microscopic examination of crude drugs," which were accepted with the thanks of the meeting.

Prof. Maisch then presented a specimen of nut galls, forwarded from Texas, by Mr. Vœlcker, of New Braunfels. They resemble, in structure, Aleppo nut galls, differing, however, in being lighter in color, having a smoother surface and containing less tannin.

Prof. Maisch also presented a handsome specimen of monobromated camphor, prepared by Mr. T. C. Linthicum, a member of the present class.

Mr. Morris, of Edw'd S. Morris & Co., was then introduced, and presented specimens of palm nuts, from which palm oil is obtained; also, palm oil, made from the pulp around the kernel, of a reddish orange color, and also a white oil, obtained from the kernels themselves. A specimen of palm soap, made in Liberia, from the fresh oil, by this firm, was then exhibited, and specimens of coffee, the entire fruit, from Liberia and Brazil, donated to the cabinet.

Mr. Morris then spoke of the manufacture of indigo, as prepared by his firm; instead of exposing the juice to the air, as usually practiced, they force air, by a steam pump, directly into the expressed juice of the plants, thus allowing oxidation to proceed with great rapidity, with the consequent great saving of time and labor, the granulated precipitate of indigo is then spread upon trays, and dried by means of hot air.

Mr. Trimble read a paper on "The presence of ammonium in phosphoric acid," prepared by Prof. Markoe's process, (see p. 113), the conclusions of the writer being that the amount of ammonia formed is so small as to be of no practical importance. Some remarks followed, in which Prof. Markoe's process was warmly commended, no objection, however, being found to the first process of the Pharmacopœia.

Mr. Chas. L. Mitchell read a paper on the preparation of the red iodide and yellow oxide of Mercury (see p. 115), and exhibited specimens prepared by the processes recommended. Prof. Maisch said that in case of the mercuric iodide, the use of mercuric nitrate had been objected to, owing to the free nitric acid necessary to keep the nitrate in solution, tending to liberate iodine; Mr. Mitchell's manipulation, however, seems to obviate this difficulty, the specimen exhibited appearing to be unobjectionable.

Prof. Maisch then read an interesting and valuable paper on "The asserted presence of tannin in gentian root," clearly showing the absence of tannic acid in this drug (see p. 117). The infusion is not at once precipitated by gelatin, and yields, with a chemically neutral solution of ferric chloride, a blackish color, due to gentisic acid, and to a body producing a green fluorescence, the color being, of course, destroyed by an acid from the decomposition of the ferric gentianate.

The papers were accepted and referred. Some discussion ensuing in regard to the time of holding the meetings; on motion it was decided to hold the next meeting on March 21st, at 3 P. M.

On motion, the meeting then adjourned.

RICHARD V. MATTISON, *Registrar, pro tem.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

THE CONNECTICUT PHARMACEUTICAL ASSOCIATION was organized at New Haven, February 9th, nine cities and towns being represented by 30 apothecaries. A Constitution and By-laws were adopted, and the following officers elected for the ensuing year: President, N. Dikeman, of Waterbury; Vice-Presidents, H. H. Osgood, of Norwich, and Henry Woodward, of Middletown; Secretary, Alfred Daggett, of New Haven, and Treasurer, G. P. Chandler, of Hartford. An Executive Committee and a Committee on Queries were appointed, and the following delegates chosen to represent the new association at the next meeting of the American Pharmaceutical Association in September next: Samuel Noyes, New Haven; A. F. Wood, New Haven; S. R. McNary, Hartford; W. W. Mosher, West Meriden; Henry Woodward, Middletown. The annual meeting will be held in the city of Hartford on the first Wednesday of February, 1877.

THE NEW HAMPSHIRE PHARMACEUTICAL ASSOCIATION held its second annual meeting in Manchester, on October 12th, Mr. Chas. S. Eastman, of Concord, in the chair. The proceedings, an account of which we have received in a neatly-printed pamphlet covering 48 pages, consisted in the reading of the officers' reports and discussions on the Pharmacy Law of the State and on apprenticeship, besides the usual routine business. The officers for the present year are Chas. F. Hildreth, of Suncook, President; P. J. Noyes, of Lancaster, and B. B. Weeks, of Manchester, Vice-Presidents; H. B. Foster, of Concord, Treasurer; G. F. Underhill, of Concord, Secretary; T. L. Smith, of Dover, Auditor, and P. J. Noyes, Reporter on the Progress of Pharmacy. The delegation to the next meeting of the American Pharmaceutical Association consists of Messrs. Geo. F. Underhill, Chas. S. Eastman, Chas. F. Hildreth, H. B. Foster and Thos. L. Smith. The Association, whose next annual meeting will convene in Nashua on the first Tuesday of October, has 87 members and 23 honorary members, six of the latter residing in Europe.

THE NEW YORK ALUMNI ASSOCIATION OF THE PHILADELPAIA COLLEGE OF PHARMACY met February 1st. After transacting the usual business, Mr. Plummer spoke of the generally bad condition in which herbs are found in most retail stores, especially in the smaller ones, and such herbs as have but little demand. He stated that they are not unfrequently kept until they become thoroughly musty and mouldy, and, though once pressed, become loose, and exhibit the change so much as to entirely efface the labels. In many stores in this city and throughout the country, drugs of this character could be found which have been in stock for a number of

years, and are yet offered for sale. There ought to be a limit to the practice, as there are but few botanical drugs which do not deteriorate by time and exposure. This class of drugs is not so important a department of the pharmacist's stock as formerly, yet it behooves us to be guarded as to the quality of all drugs passing through our hands, and it ought to be somebody's business to look after it.

Mr. Messing said, if parties engaged in putting up herbs, etc., were required to print the date of growth on each package, it would be an important precaution. Most druggists thoughtlessly allow an old stock of herbs to accumulate, forgetting their age; but he thought it not warrantable in any case that they be kept longer than two to five years, even in proper receptacles, while many druggists keep them in paper or cigar boxes or loosely piled upon shelves. It was suggested that the remarks would as well apply to some pharmaceutical preparations which, being little used, stand on the shelves for years, becoming entirely unfit for use, yet they are dispensed. The appointment, by the College of Pharmacy or by the Board of Health, of an inspector was suggested, who should be an expert of recognized ability, and vested with power to condemn all drugs which, after faithful examination, prove to be inert, sophisticated or adulterated. The report of the Committee on Adulterations and Sophistications, made at the last meeting of the American Pharmaceutical Association, shows that quite a variety of such drugs find their way into the pharmacies, either through the ignorance or carelessmess of pharmacists. The discussion was extended to some length, bringing out many interesting facts upon this important subject, showing that many drugs pass through our market that would be much more fitting in accompaniment with the wares of Shakspeare's woe-begotten apothecary of Mantua than to the stock of an American pharmacy.

The next meeting will be held Tuesday evening, March 7th, when nominations are to be made for officers for the ensuing year.

THE MARYLAND COLLEGE OF PHARMACY held a pharmaceutical meeting, February 16th, at which Mr. W. S. Thompson read a paper on hydrobromic acid, and Mr. J. F. Hancock one on saffron, giving a sketch of its history, &c. We are pleased to learn that this College has purchased from the city of Baltimore one of the school-houses, which is located in a pleasant and quiet neighborhood, and has a lot 74 feet front by 110 feet deep.

CINCINNATI COLLEGE OF PHARMACY.—The first pharmaceutical meeting for the year 1876 was held February 9th, President Eaton in the chair. The attendance was unusually large, and much interest was manifested. Prof. Judge gave the result of his experiments on discolored syrup of iodide of iron, and recommended hypophosphorous acid as the agent to restore the altered syrup, in preference to hyposulphite of sodium, which, on being added to discolored syrup, passes into sodium sulphate, and precipitates one-half of the sulphur it contains, leaving the syrup as unpleasant in appearance as before the addition. Hypophosphorous acid, having the same affinity for oxygen, would effect the same change as the hyposulphite, leaving, however, the syrup clear and of the proper color.

Prof. E. S. Wayne exhibited a specimen of Indian mallow (*Abutilon Avicennæ*) nat. ord. Malvaceæ, which is a troublesome weed. Paper, he remarked, was made

from the whole stock of the plant, which yielded also an exceellent flax-like fibre, that had been woven into fabrics and made into twine and cordage. The Professor presented to the cabinet a beautiful specimen of "chimaphilin," and three specimens of true balsam of copaiva.

On motion, thanks were returned for the donations and remarks. Adjourned, to meet March 8th, 1876, at 3 o'clock P. M. LOUIS SCHWAB, *Cor. Sec.*

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—President T. H. Hills occupied the chair at the pharmaceutical meeting held February 2d. Mr. James Deane read a paper entitled "The best form of blistering liquid" The *Liquor epispasticus*, Br.P., is made by incorporating 4 fluidounces of acetic acid with 8 oz. of powdered cantharides, and percolate the mixture, after 24 hours, with ether, until 20 fluidounces are obtained; from 2 fluidounces of this preparation 0·8 grains of cantharidin were obtained. Exhausting the cantharides with sufficient acetic ether to obtain 20 fluidounces of percolate, 2·2 grains of slightly impure cantharidin were obtained from 2 fluidounces. The same amount of another preparation, made by moistening the cantharides with a solution of glacial acetic acid in ether, and percolating with ether, yielded 1·8 grains of cantharidin; 350 grains of cantharides, representing 2 fluidounces of the above liquids, yielded 2 grs. of pure cantharidin. The author is therefore in favor of one of the last two menstrua, the question as to which is the better being medical rather than pharmaceutical. The officinal preparation being stronger than necessary, a reduction of the powdered cantharides to 4 or 5 ounces is advocated.

Mr. Harold Senier read a paper on "The Composition of Pilula Hydrargyri, Br.P." A number of samples were analyzed, with the view of determining the amount of metallic mercury and of mercurous and mercuric oxides. The results showed that the latter gradually increased in quantity with the age of the blue mass, which, 18 hours after preparation, was found to contain but a trace of mercurous oxide; after three months, ·24 per cent. mercuric and ·62 per cent. mercurous oxides were obtained, and in another sample, ·44 and 1·60 per cent. respectively. After two years, 1·80 mercuric and 4·22 mercurous oxides were present. The amount of mercury in the nine samples examined corresponded with the requirements of the "Pharmacopœia."

In the discussion following, Professor Redwood called attention to his researches, made 14 or 15 years ago, upon Hydrargyrum cum cretâ, which was found to be more rapidly oxidized than blue mass, particularly if made by machinery instead of in the mortar. Mr. Greenish referred to the paper of Dr. Squibb ("Amer. Jour. Phar.," 1857, p. 388), in which the proneness to the oxidation of mercury in Hydrarg. c. cret. is attributed to its often being too finely divided.

Mr. John Moss read a paper on *Vaseline*, showing that this term must be regarded as a distinctive name for a mixture of paraffins obtained by a known process, and recommended as a substitute for lard and other similar substances for pharmaceutical purposes.

Mr. A. W. Gerrard followed with a paper in which he favored the preparation of suppositories, using four parts of vaselin and one of paraffin as a base. The advantages over cacao butter are that the former melts slowly into an unctuous mass, which is cleanly and causes no inconvenience to the patient; that it does not become

rancid, and that owing to its great power of contraction the suppositories leave the moulds with greater ease.

Preparations made with vaselin were shown by several gentlemen. Considerable difference of opinion was expressed as to the adaptibility of paraffin mixtures for suppositories. Messrs. Allchin and Williams opposed the use of paraffins in ointments, because they would not be absorbed by the skin, in which respect lard was by far superior.

EDITORIAL DEPARTMENT.

CENTENNIAL BUREAU.—It will be of interest to those of our readers who contemplate exhibiting goods at the approaching international exposition, to learn that the house of Peter Wright & Sons, agents for the transatlantic steamers running to Philadelphia, has established a bureau for the purpose of attending to the interests of exhibitors, and will undertake the transportation of goods from Liverpool or Antwerp, their reception at this port, their proper installation, the general care during the exposition, their disposal or repacking and return. The labor will be divided among experts and firms of acknowledged reputation in the leading departments of industry and arts, Messrs. Bullock & Crenshaw taking charge of drugs, chemicals, chemical apparatus and perfumery. If it is desired, competent persons will be engaged to give their exclusive time to the exhibition and explanation of goods.

Having received several inquiries in regard to such or similar arrangements, it is likely that other readers of the "Journal," in this and foreign countries, may avail themselves of such an opportunity.

FEMALE APOTHECARIES.—During the past session two ladies have been attending the lectures at the Philadelphia College of Pharmacy. At the December examination of the Pharmaceutical Society of Great Britain, Isabella Skinner Clarke passed the major examination, and was duly registered as "Pharmaceutical Chemist."

THE GROWTH AND USES OF BENZOIN.—Under this title, our last number contained an essay which was duly credited to the journal in which we found it published, without reference to any other source. Our thanks are due to several correspondents who called our attention to the fact that the paper in question is almost literally copied from Flückiger and Hanbury's "Pharmacographia," and should, therefore, be credited to that excellent work.

PANCREATIN.—The last volume of the "Proceedings of the American Pharmaceutical Association" contains an interesting paper on this subject, from the pen of Prof. E. Scheffer, of Louisville. In the last sentence on page 731 we find a typographical error, whereby the author is made to say the opposite of what the results of his experiments point to; the sentence in question should read: "The foregoing experiments . . . . prove the *uselessness* (not usefulness) of pancreatin as a therapeutical agent, as it will be decomposed when brought into the stomach."